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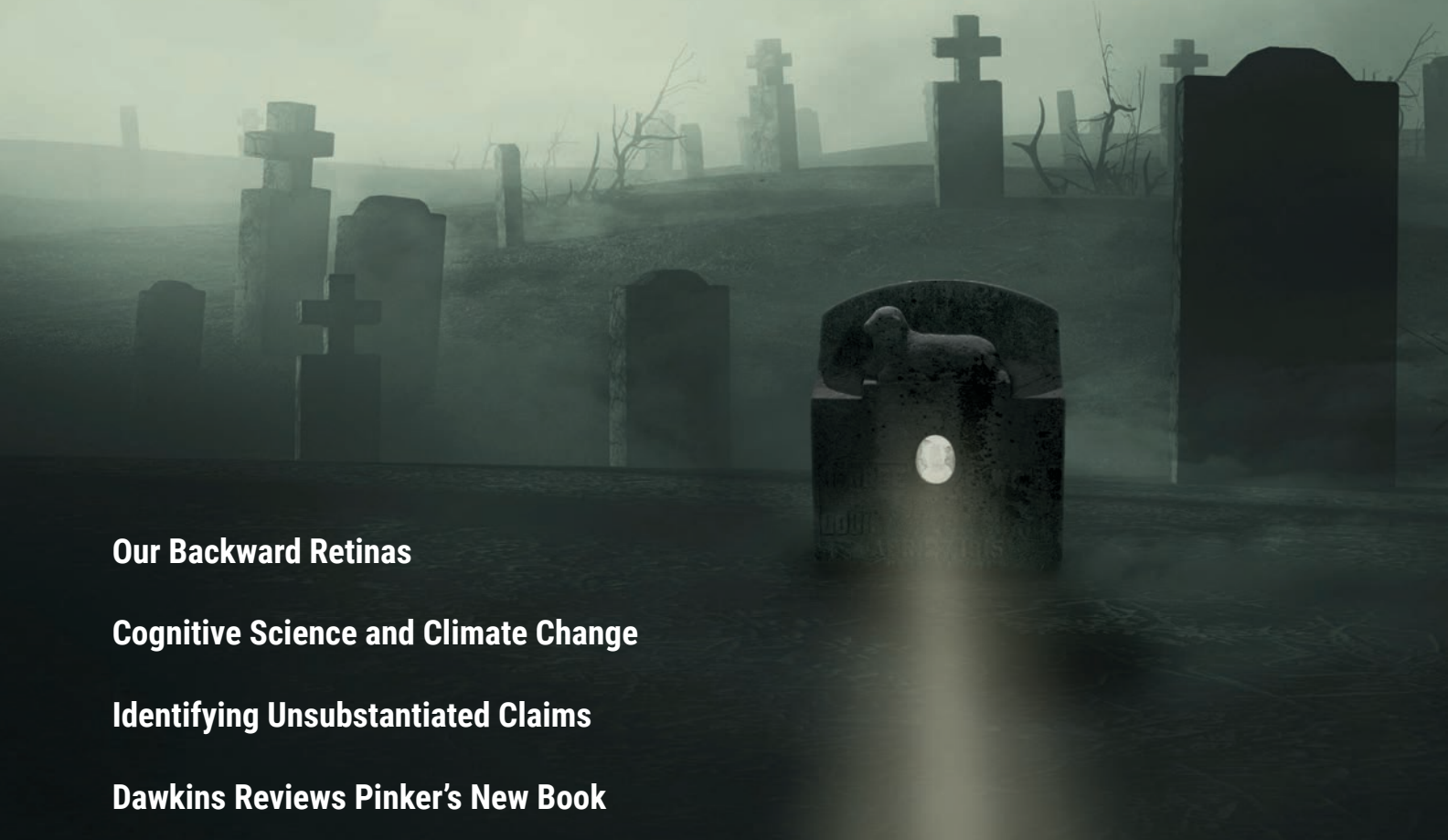
Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON Vol. 47, No. 1 | January/February 2023

The Devil's Baby of Ravenswood

A Folkloric Appalachian Legend 'Brought to Light'



Our Backward Retinas

Cognitive Science and Climate Change

Identifying Unsubstantiated Claims

Dawkins Reviews Pinker's New Book

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Kendrick Frazier (1942–2022): A Farewell to Readers in His Own Words

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Applying Science to SCAM: A Brief Summary of the Past Thirty Years

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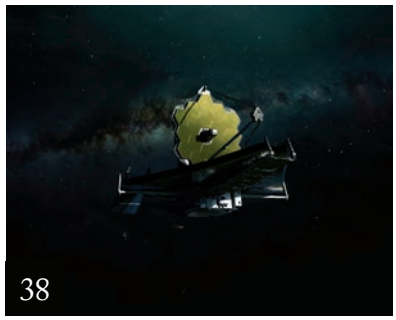

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"… promotes scientific inquiry, critical investigation, and the use of reason in examining controversial and extraordinary claims."

[FROM THE MANAGING EDITOR

A Moving Farewell to SI Readers

"Legacy, what is a legacy?/ It's planting seeds in a garden you never get to see/ I wrote some notes at the beginning of a song someone will sing for me."

—Lin-Manuel Miranda

Kendrick Frazier, beloved editor of the Skeptical Inquirer for the past forty-five years, passed away on November 7, 2022. A forthcoming issue of SI will be devoted to Ken's life and legacy through the words of others. In this issue, Ken gifts all of us with a recounting of his legacy in his own words. As always, they were carefully and perfectly chosen. Less than two weeks before succumbing to his recent diagnosis of acute myeloid leukemia, Ken emailed me from his hospital bed: "I am thinking of writing a special editor's column this issue that'd be a narrative report on my sudden and grave medical diagnosis. I think readers should know and I'd love to have them hear from me. … [I'd] fill it out with our previous wonderful vacation. And I could make a few observations about the uncertainties of life and the continuing value of skepticism."

The result is what opens this, the first issue of our forty-seventh year. What Ken humbly titled "A Personal Note to Readers" is so much more. It's a love letter—to his readers, his family, his colleagues, and skepticism itself—and, ultimately, a goodbye.

***

The Committee for Skeptical Inquiry (CSI) was founded in 1976 as the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP). The cover feature of this issue goes back to those roots of investigating paranormal claims. In his article "The Case of the Devil's Baby of Ravenswood," SI contributor Daniel A. Reed conducts a classic investigation into a grave marker that gives off a supposedly "otherworldly" glow in the nighttime. The headstone, located in the Appalachian city of Ravenswood, West Virginia, marks the grave of George Elwood Sharp, who perished at the age of two in 1917. As Reed tells us, natural wear during the intervening century-plus explains the supposed "devilish" look of the child's image on the headstone's ceramic plate. But what of that mysterious glow? Reed invites the reader to follow him on his investigation, which includes conducting an experiment with a homemade light-blocking device. Reed hopes his findings will finally "put to rest the myth that little George Elwood Sharp was some type of monster or demon."

Also in this issue is an article by professor of biology Nathan H. Lents, whose laboratory studies the evolution of the human genome with a special focus on the genetics of human uniqueness. In "The Night Begins to Shine: The Tapetum Lucidum and Our Backward Retinas," Lents explains why the tapetum lucidum—a structure in some vertebrates that boosts detection of light in dim conditions to compensate for the backward wiring of the inverted vertebrate retina—is evidence *for* evolution rather than against it as some creationists argue.

***

It is with much sadness that we present you with the final issue of Skeptical Inquirer that will ever be crafted through Kendrick Frazier's expert leadership. But Ken had faith in the future of the skeptical movement that he so lovingly helped found. His legacy will guide us all.

—Julia Lavarnway

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Our Vision: A world where people value evidence and critical thinking, where superstition and prejudice subside, and where science and compassion guide public policy.
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A Personal Note to Readers of the Skeptical Inquirer

KENDRICK FRAZIER

It was just a small anomaly, a mystery. In August, I had two routine doctor's follow-up visits. The blood tests each showed a puzzling drop-off in red blood cells. But I assured my doctors that I felt fine, had all my regular energy, and was ready for the vacation trip my wife, Ruth, and I had been planning for September.

We had a wonderful time. We are both devotees of our national parks, and this 3,700-mile driving trip would take us from Albuquerque to Denver to Grand Teton, Yellowstone, and Glacier National Parks. In Grand Teton, we awoke early and took our coffee outside Jackson Hole Lodge, a beautiful place in itself that I first visited with my grandparents when it was new. This time Ruth and I would wait for mountains to turn alpine pink each morning and listen for moose. One evening the new moon set over the Tetons, adding just the right visual touch.

Then to Yellowstone and the vast Yellowstone Supervolcano Caldera, where we were fortunate to stay in the venerable Old Faithful Inn. The first morning we took a sunrise photographic safari in one of those quaint 1937 yellow buses. We saw our first Yellowstone sunrise from Nez Perce Creek, a fumarole illuminated by the first light of the sun.

We saw a lone trumpeter swan that lives out here all by itself. And on a drive back along the Yellowstone River, we watched two elk—a bull and a cow—on the side of the riverbank. When the female walked down into the river itself, the bull let loose the primal call wild animals make when asserting their primacy, only this time we were lucky enough to be present.

One evening we made our way to one of Yellowstone's most magnificent thermal features, the Grand Prismatic Springs. The only way to get a full sense of the deep range of blue colors that make this place so special is through drone photos taken directly overhead. Those of course aren't allowed to visitors, but the official publications are populated by cover shots of Grand Prismatic. I had to be satisfied with seeing it in after-sunset blues from ground level, a lovely moon reflected in its waters. I think we did okay with that.

And then to Hayden Park and bison, bison, bison. Hundreds, perhaps thousands, of bison spread along the river's valley and its islands and peninsulas. We kept returning. They are such magnificent creatures! Some approach the roads and walk along or across them, and it is best to let the primary creatures have their way.

Our drive north to Glacier National Park from Missoula

Skeptical Inquirer's editor of forty-five years, Kendrick Frazier (1942–2022)

north along Flathead Lake was our first, but not our last, encounter with the vast extents of the wildfires that had been burning all over the Northwest. Nothing but smoke and haze. Two of our three days in Glacier we had hazy skies as well. But none of that deterred from our enjoyment.

The first morning while we crossed Going-to-the-Sun Road, at one point traffic came to a full stop. When we came around a bend, I looked up and was stunned to see a magnificent Rocky Mountain sheep resting on a ledge just above us. He posed as seriously as if he had been in a diorama at one of our natural history museums. Three quick photos, and off we had to go.

Earlier, a local man had a set of high-powered binoculars focused on a herd of mountain goats high up on what seemed a near-vertical ridge.

It was while walking up and down a high ridge that separates the parking lot at Many Glaciers Lodge (where we had a boat trip scheduled) that I realized something was not right. I had to rest multiple times while ascending the ridge, which

Ken and his wife, Ruth, at Excelsior Geyser Crater at Yellowstone on September 6, 2022

provides a spectacular view of the lodge from way above with mountains and glaciers all behind. But it seemed a momentary glitch.

Leaving the lake tour, I was keenly aware that it is nature, and uniquely mountain nature, that revives my spirit, enhances my sense of well-being, and makes trivial problems disappear, at least temporarily.

The long drive back south from northern Idaho down past Flathead Lakes was again marred by thick smoke and haze, as was the way past Missoula and southwestern Montana and down through hundreds of miles of grassy valley. The locals we talked to were more tired than we of the situation and had a resigned sense of the near apocalyptic.

We had further adventures on the way home (Ruth fell and fractured a vertebra, which from then on seemed the main medical concern). But by the time we got home, I found myself exhausted and barely able to unpack.

We agreed I would check again with my doctors in the coming days, which I did on the next day. They immediately scheduled me for a blood transfusion followed by a program of immunotherapy.

At this point, we were still operating under the assumption that I was suffering a flare-up of chronic myeloid leukemia, something I had been happily living with without any treatments or problems (just observation every six months) since 2009. It had seemed so minor I had told almost no one.

But on October 10, all that changed. My oncologist, looking at the numbers, realized they just didn't add up; something about them didn't make sense. She sent my reports to a pathologist. She called me back with the news immediately. The time was 5:25 p.m. on October 10. I have acute myeloid leukemia (the worst and most aggressive kind). My wife and I both visibly winced at this terrible new diagnosis and reached for each other's hands. My oncologist said I would need to be hospitalized almost immediately.

I had just finished writing my book *Shadows of Science*, my own personal examination of the contrasts between real science and pseudoscience. But I hadn't submitted it yet. I quickly put the pieces and finished chapters all together and sent them to my publisher at Prometheus Books, which will publish it in August 2023. That was a great relief.

Three days later, I was in the hospital beginning a round of chemo. I am still here as I write this.

I had to write CFI CEO Robyn E. Blumner and CSI Executive Director Barry Karr because this of course meant I couldn't come to CSICon in Las Vegas. As for SI, Managing Editor Julia Lavarnway is doing her best to fill in the many places I can't.

I soon had a bone marrow biopsy. The next week when the results came in, my hospital oncologist said, "There is news about your leukemia, and none of it is good." Not words one wants to hear.

Turns out I have a serious defect in an important gene (TP53) that conveys protections against leukemia. Without its presence, I am almost totally vulnerable to the leukemia. Nevertheless, I am on a formal chemotherapy program that they hope can help me get home at least for a time.

I have lived a fortunate life. My heart is full of gratitude.

We have a wonderful family, led foremost by my wife of fifty-eight years, Ruth, who is one of the most dynamic, warm, loving, giving, competent women I have ever known; our dear son, Chris, and late daughter, Michele; and grandchildren galore—seven from ages five to thirty. All on their own journeys.

Then, I have had two dream jobs. First as a young science journalist, I became editor of *Science News* and stayed at the helm there for seven full years.

I went straight from *SN* to SI. I became editor of Skeptical Inquirer in August 1977 and have had the good fortune to edit the world's leading magazine of science and reason for all that time. Throughout I have had willing authors from all over the world and a team of editorial staff members of extreme dedication who are also friends. What more could one ask?

We cannot know how and when one's life will end, although my situation has now taken on greater clarity.

Skepticism has taken on an importance and relevance even greater than in earlier times. New generations of scientific skeptics are moving into positions of influence. I have no qualms about their being up to the task and only wish I could journey along with all of you a while longer. We will see.

Thank you all for being such great contributors, readers, and supporters. It has been a pleasure. ■

Kendrick Frazier, who was editor of the Skeptical Inquirer for forty-five years, passed away on November 7, 2022. A tribute issue of the Skeptical Inquirer dedicated to Ken is forthcoming.

Homeopathy on Trial: CFI Suits against Walmart and CVS on Consumer Fraud Allowed to Proceed

Jeff Dellinger

On September 29, 2022, a three-judge panel for the D.C. Court of Appeals, the highest court in the District, reversed the dismissal of suits the Center for Inquiry (CFI) brought against Walmart and CVS over claims that they deceived customers by marketing fake medicine as if it were real.

Walmart and CVS shelve homeopathic products alongside science-based medicine. This placement is deceptive to consumers who can easily confuse it for scientifically tested products that provably work—which they are not. CFI's suits had been dismissed by two lower D.C. courts.

But in a unanimous opinion written by Senior Judge Phyllis D. Thompson, the appeals court ruled that the placement of products on a store shelf does, in fact, communicate information to consumers that they can rely upon and be deceived by.

In addition, the court reversed the lower courts' rulings that held CFI cannot bring claims on behalf of consumers under the D.C. law because it is not a consumer protection organization. The appellate court correctly determined that CFI's longstanding work against the fraud of homeopathy and all pseudoscience qualifies it as a consumer protection organization.

CFI Legal Director Nicholas Little, who argued the appeal in January 2022, stated, "The Court of Appeals rightly recognized that giant retailers can't just deny responsibility for how they present what are fundamentally worthless products. It's a huge victory for consumers and their right not to be misled."

Little continued, "DC's highest court acknowledged what we've always known—CFI's decades of work against pseudoscience like homeopathy is consumer protection work. We're not going away, and it's time for CVS, Walmart, and all other retailers to stop misrepresenting homeopathy as medicine."

The appeals court decision is a significant victory, but Little notes the real fight is still ahead. "It's great to see the court be so forceful in upholding our argument," Little said. "They've given us the chance to prove that these retailers are defrauding consumers. Now it's up to us to do that."

See Little's special report on the topic on p. 9. ■

Jeff Dellinger is the communications manager for the Center for Inquiry.

Most Americans Concerned with Fake News, but 'Fake News' May Be 'Old News'

David Tolkacz

According to a poll conducted by the Pearson Institute in September 2022, 91 percent of Americans believe that the spread of misinformation is a problem. Additionally, the poll showed that seven out of ten Americans believe misinformation increases extreme political views, contributing to escalating racial violence, gender violence, hate crimes, and terrorist attacks.

While "fake news" seems like a new phenomenon, it may not be very new at all. Many of the prevailing conspiracy theories target minority communities, such as Asian Americans. They became the targets of a growing number of racist attacks amid conspiracy theories that alleged China intentionally manufactured and released COVID-19 as a bioweapon. Jews have long been the world heavyweight champions of targets for conspiracy theories. "Fake news" such as *The Protocols of the Elders of Zion* has been used as justification for the blood libel myth for centuries.

Today, conspiracy theories involving George Soros, Hollywood, pedophiles, adrenochrome, reptiles, and the Illuminati all have a hint of the blood libel myth coursing through them. Some conspiracy theorists believe the tendrils of the global banking consortiums have been pulling strings from behind the scenes since the last Templar laid down his shield on the field of battle.

While "fake news" may be nothing new, there *have* been recent upticks in racial violence linked to conspiracy theories. Federal authorities have recorded large increases in the number of hate crimes against Asian Americans and African Americans since 2020. According to an NBC News story, Asian-reported hate crimes increased a whopping 339 percent, with major urban areas reporting the majority of assaults and murders.

While many conspiracy theories may sound bonkers enough to be funny, it's important to remember that this sort of propaganda has a long history associated with racist violence. In fact, it often acts as a portent of things to come. So Americans ought to be concerned about this type of misinformation. It is designed to provoke violence. ■

David Tolkacz is a freelance writer living in Buffalo, New York.

French Scientist Passes Off Chorizo as Star Closest to the Sun

Julia Lavarnway

The James Webb Space Telescope was launched on December 25, 2021, and its first images were released to the public just over six months later on July 11, 2022. SI featured several of its images in the September/October 2022 issue. People around the world were awed by the stunning renderings from the infrared telescope, and most responses reflected that. (For a rundown on the various reactions to the pictures from the religious, see "The James Webb Space Telescope: First Responses from Religion" by Manfred Cuntz on p. 38 of this issue.) However, one scientist from France had a different response. It was decidedly more tongue-in-cheek—and that cheek also seemed to be full of a popular charcuterie component.

Etienne KLEIN
@EtienneKlein
Photo de Proxima du Centaure, l'étoile la plus proche du Soleil, située à 4,2 année-lumière de nous.
Elle a été prise par le JWST.
Ce niveau de détails... Un nouveau monde se dévoile jour après jour.
Translate Tweet
3,883 Retweets
2,984 Quote Tweets
21.3K Likes

Étienne Klein, a physicist and research director at France's Alternative Energies and Atomic Energy Commission, tweeted a picture of a round, reddish, speckled object. With the picture, he wrote (as translated from French), "Photo of Proxima Centauri, the closest star to the Sun, located 4.2 light years from us. She was taken by the JWST. This level of detail … A new world is revealed day after day." Soon after the tweet went out, Klein revealed that his photo was a hoax—but not before the tweet was liked and retweeted by more than 20,000 people.

Klein called the tweet "a scientist's joke" and urged his followers to be cautious with images that can be taken out of context. He further joked, "Well, when it's time for the aperitif, cognitive biases seem to have a field day. … According to contemporary cosmology, no object belonging to Spanish charcuterie exists anywhere but on Earth."

There's no doubt that had the sausage been tweeted by someone other than a famous physicist, not nearly as many people would have fallen for it. But as Carl Sagan himself, perhaps the most famous science popularizer of all time and a founder of CSI, proclaimed in his *The Demon-Haunted World: Science as a Candle in the Dark*, "One of the great commandments of science is: 'Mistrust arguments from authority.' … Too many such arguments have proved too painfully wrong. Authorities must prove their contentions like everybody else."

It seems Klein agrees with Sagan. "I feel compelled to clarify that this tweet showing an alleged snapshot of Proxima Centauri was a form of amusement. Let us learn to be wary of arguments from authority." ■

Julia Lavarnway is managing editor of the Skeptical Inquirer.

Score One for the Good Guys—a Major Battle Won in the Continuing War on Homeopathy Fraud

NICHOLAS LITTLE

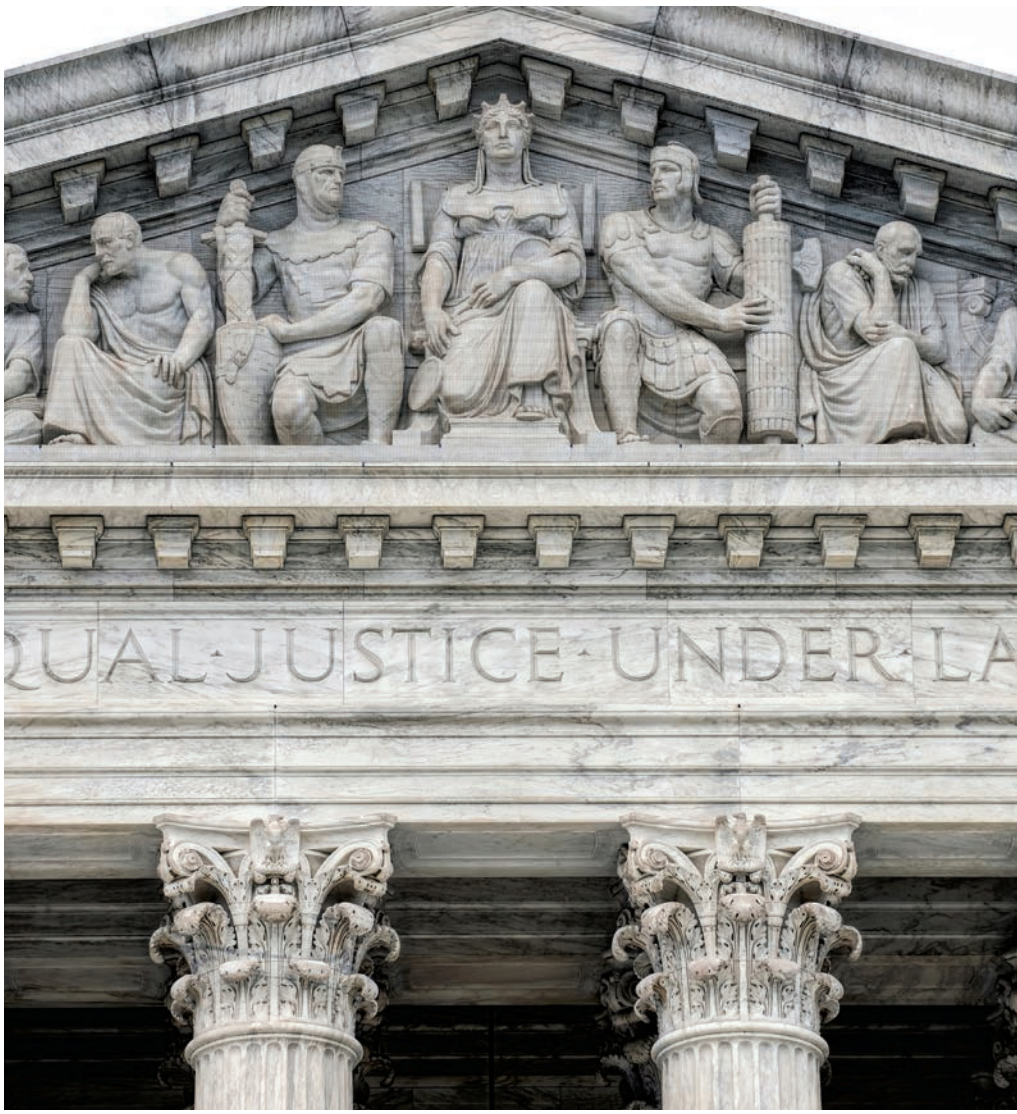
Opposing pseudoscience *is* consumer protection. We at the Center for Inquiry (CFI) know that. You know that. And, finally, the D.C. Court of Appeals has recognized that as well.

It's been a long time since I argued CFI's case in front of the D.C. Court of Appeals in January 2022 and an even longer time since we first briefed the appeals in both *CFI v. CVS* and *CFI v. Walmart*. Even by the glacial speed standards of the legal system, it has been a long delay. But on September 29, 2022, finally, we got what we've been waiting for: the appeals court reversed and remanded the dismissal by the trial courts of our claims, and we can now go forward.

There are two key parts to the decision. The first is on standing. The trial courts decided that CFI wasn't a consumer protection organization because, although we have decades of history of work against pseudoscience, that work was theoretical, not consumer protection. According to the lower courts, we just wanted to show that homeopathy (and reiki healing and acupuncture and so on) is bunk, and that's that. The Appeals Court, though, rejected this. It recognized that "CFI's mission-driven opposition to homeopathy as a pseudoscience and CFI's efforts to remove homeopathic drugs from the market show that, at least in part, CFI both is organized and operates to promote the interests of those who would be consumers of 'ineffective' homeopathic products."

This is a really big deal. Had it gone the other way, our whole litigation campaign against homeopathy would have been hobbled. CFI's use of this D.C. law to challenge retailers and manufacturers depends, unsurprisingly, on the courts allowing us to do so.

The second key element of the decision regards the trial courts' assertion that CFI failed to allege anything that could reasonably be considered deceptive to consumers. Walmart and CVS have the ability to deny responsibility and maintain that their product placement, and the signage that goes along with it, doesn't really mean or suggest anything at all. That's clearly nonsense, and any reasonable observer can see that. If a store stocks something below a sign that reads "Pain Relief," the obvious and reasonable presumption is that the store is trying to say that the products provide pain relief. Especially



when it's a store that advertises itself as a "partner" to consumers in making their health care decisions.

The Court of Appeals smacked down this counterintuitive notion. It said in no uncertain terms, "we hold as a matter of law that the placement of a product can be a representation within the meaning of the CPPA [Consumer Protection Procedures Act]." Of course, this doesn't mean that CVS's and Walmart's actions here *were* fraudulent misrepresentations. What it *does* mean is that CVS and Walmart have to answer the allegation. The Court of Appeals remanded these cases back to their respective trial courts. In essence, it's giving us our day in court; we get to go through discovery, question their employees on the record, and try to prove that the stores' actions violated the law.

The war still has a long way to go, but this battle has ended in a major victory. Not surprisingly, the defendants don't want to concede that victory.

Walmart and CVS have joined forces once more to request a rehearing on the appeal, supported by an amicus brief from the Retail Litigation Center, Inc., and the National Retail Federation. We've certainly gotten their attention.

This is a rarely granted remedy that essentially asks for a "do over," either from the original division of the court of appeals or an *en banc* hearing of the entire court. According to the court's rules, it is only to be granted where it is "necessary to secure or maintain uniformity of the court's decisions" or where it "involves a question of exceptional importance." The first part—uniformity—simply isn't at stake here. The retailers and their associations, however, claim that the original decision will open them up to a tsunami of lawsuits. They claim that they can't be held responsible for the placement of products.

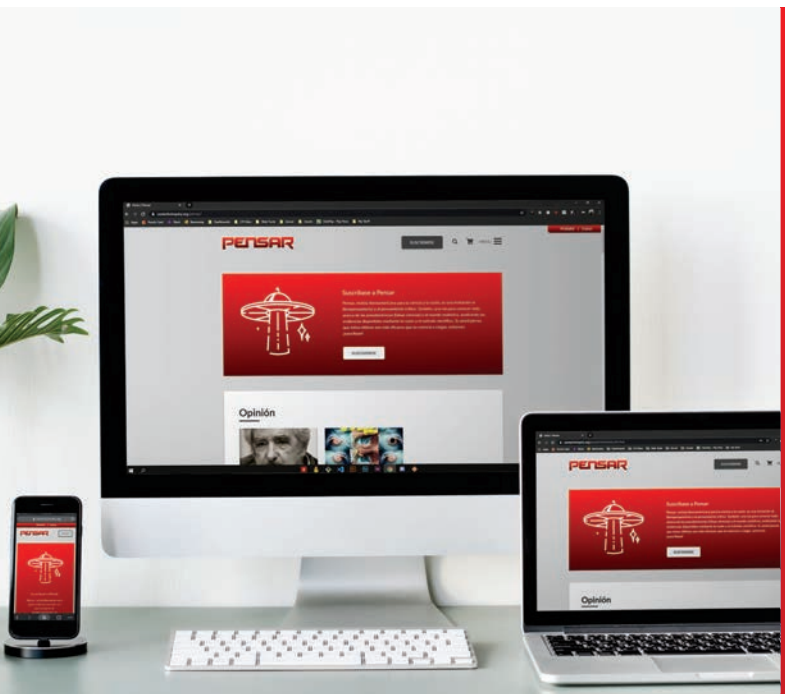
This, of course, is nonsense. CFI's case, and the appellate decision, doesn't rest solely on the products' positions on the shelves but the fact that the positioning and intermingling with real medicine *along with* signage makes claims about the product. A sign "pain relief" tells a customer that products in that section relieve pain; Advil, Aleve, and Tylenol do just that. Homeopathic Arnicare, carefully slipped between those real medicines, does not.

We don't expect this Hail Mary attempt by the retailers to be successful, but if it is, we will argue the appeals again, and we firmly believe we will win again. What it shows is how worried they are—so worried that they had to go running to national retailer associations for support to try to overturn this. As soon as we know the result, so will you. It's likely, I think, that both defendants will want to talk more seriously about a settlement and how they can avoid having to defend how they sell products they know are worthless in front of a jury. If they don't provide a real, impactful change to their behavior, then the cases will continue.

You can follow all our work in this area on the website for the Office of Consumer Protection from Pseudoscience. And there's a lot happening. Boiron, the world's largest manufacturer of homeopathy, has officially answered our complaint (spoiler alert: they disagree with our claims!), and the trial court has established a schedule for discovery and motions in the case. We've also sent letters to both Amazon.com and Chewy challenging the ways in which they recommend and promote homeopathic remedies for humans and animals. We're waiting on their responses.

There's much more work to be done, but, for now, we're enjoying being able to celebrate a win. Cheers! ■

Nicholas Little is vice president and general counsel for the Center for Inquiry.



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Applying Science to SCAM: A Brief Summary of the Past Thirty Years

EDZARD ERNST

It has been almost thirty years since I started my job at the University of Exeter as a full-time researcher of so-called alternative medicine (SCAM). Perhaps this is a good time to reflect on what has happened during this time in the realm of SCAM research.

One of the first things I did after being appointed in 1993 was to define the aim of my unit, which was to apply science to SCAM. At the time, this intention upset quite a few people. The most prevalent arguments of SCAM proponents against my plan (apart from attacks on me personally) was that the study of SCAM using scientific methods was quite simply impossible. They claimed that SCAM included holistic and complex interventions that cannot possibly be put into the "straight jacket" of conventional research, e.g., a controlled clinical trial.

I then spent the next few years showing that this notion was erroneous. Gradually and hesitantly, SCAM researchers seemed to agree with my view—not all of them, of course, but at first a few and then slowly, often reluctantly, the majority of them. More often than not, their motivation seemed to be that if nothing else, research would be good for promotion.

What followed was a period during which we and several other research groups started conducting more or less rigorous tests of the hypotheses underlying SCAM. All too often, the results of these tests turned out to be disappointing, to say the least: not only did most of the therapies in question fail to show efficacy, but they were also by no means free of risks. Perhaps worst of all, much of SCAM was shown to be biologically implausible.

The realization that rigorous scientific scrutiny often generated findings that were not what SCAM proponents had hoped for led to a sharp decline in the willingness of SCAM enthusiasts to conduct or cooperate in research. Many of them began to doubt whether science was such a good idea after all.

But how could they change their minds without losing face? The solution was simple: they had to appear to be dedicated to science but argue that a different type of scientific approach was required. An article from 2014 may serve as a good example of this revised stance of SCAM-proponents on science. Here proponents of alternative medicine argued that:

> The reductionist placebo-controlled randomized control trial (RCT) model that works effectively for determining efficacy for most pharmaceutical or placebo trial RCTs may not be the most appropriate for determining effectiveness in clinical practice for either CAM/IHC or many of the interventions used in primary care, including health promotion practices. Therefore, the reductionist methodology inherent in efficacy studies, and in particular in RCTs, may not be appropriate to study the outcomes for much of CAM/IHC, such as Traditional Korean Medicine (TKM) or other complex non-CAM/IHC interventions—especially those addressing comorbidities. In fact it can be argued that reductionist methodology may disrupt the very phenomenon, the whole system, that the research is attempting to capture and evaluate (i.e., the whole system in its naturalistic environment). Key issues that surround selection of the most appropriate methodology to evaluate complex interventions are well described in the Kings Fund report on IHC and also in the UK Medical Research Council (MRC) guidelines for evaluating complex interventions—guidelines which have been largely applied to the complexity of conventional primary care and care for patients with substantial comorbidity. These reports offer several potential solutions to the challenges inherent in studying CAM/IHC. (Coulter et al. 2014)

One of several options for evaluating complex interventions that suited SCAM proponents particularly well is the "A+B versus B" trial. It is a type of study that looks rigorous and guarantees generating nothing but positive results. There are now hundreds of these "pragmatic" trials, and their principle might be best explained using an example. Let's take one titled "Acupuncture for Cancer-Related Fatigue in Patients with Breast Cancer: A Pragmatic Randomized Controlled Trial" (Molassiotis et al. 2012). The study tested acupuncture as a treatment of cancer-related fatigue. Cancer patients who were suffering from fatigue were randomized to receive usual care or usual care plus regular acupuncture. The researchers then monitored the patients' experience of fatigue and found that the acupuncture group did significantly better than the control group. This looked like an encouraging result; an editorial in the journal confirmed this impression by calling the evidence "compelling" (Bower 2012). Due to a cleverly overstated press release, news spread fast, and the study was celebrated worldwide as a major breakthrough in cancer care. Finally, most commentators felt, research had identified an effective therapy for a debilitating symptom that affects so many of the most desperate patients. Few people seemed to realize that this trial tells us next to nothing about what effects acupuncture really has on cancer-related fatigue.

To understand this better, we might take a closer look at the trial design and employ an analogy. Imagine you have an amount of money A, and your friend owns the same sum plus another amount, B. Who has more money? It's simple: of course your friend. A+B will always be more than A (unless B is a negative amount). For the same reason, "pragmatic" trials following the "A+B versus B" design will always generate positive results (unless the treatment in question does significant harm). Treatment as usual plus acupuncture is more than treatment as usual, and the former is therefore more than likely to produce a better result. This is true even if acupuncture is a mere placebo. After all, a placebo is more than nothing, so the placebo effect will have an impact on the outcome, particularly if we are dealing with a highly subjective symptom such as fatigue.

I can be fairly confident that this is more than a theoretical consideration, because we once analyzed all acupuncture studies with such a design (Ernst and Lee 2008). Our hypothesis was that none of these trials would generate a negative result. I probably do not need to tell you that our hypothesis was confirmed by the findings of our analysis. Theory and fact are thus in perfect harmony.

Studies following the "A+B versus B" design can be randomized and thus appear to be rigorous. This means they can fool a lot of people. Yet they do not allow conclusions about cause and effect. In other words, they fail to show that the therapy in question has led to the observed result. Acupuncture might be utterly ineffective as a treatment of cancer-related fatigue, and the observed outcome might be due to the extra care, a placebo-response, or other non-specific effects.

The current frequent use of the "A+B versus B" design by SCAM researchers is much more than a theoretical concern. Armed with such (false) positive results, SCAM proponents evidently want us to integrate SCAM into real medicine. But rolling out acupuncture (or any other SCAM supported by such pseudo-research) across routine care at high cost would be entirely the wrong solution. Providing good care with empathy and compassion could be much more effective and less expensive than acupuncture. Moreover, adopting acupuncture on a grand scale would keep us from looking for a treatment that is truly effective beyond a placebo—and that surely would not be in the best interest of the patient.

So, in the past thirty years of SCAM research, we have gone from the rejection of science to accepting that it would be good for promotion, to insisting on an "alternative" version of science, to misleading the public with false-positive findings. It has been a long and tedious journey without actually advancing all that far. ■

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Edzard Ernst is emeritus professor, University of Exeter, United Kingdom, and author of several books, including *Don't Believe What You Think: Arguments for and against SCAM*.

Joe Nickell, PhD, has been a magician, Pinkerton detective, and historical document consultant, among other personas. He is author of nearly fifty books, including *Pen, Ink & Evidence*.

History Real or Fake: Some Cases of an 'Academic Forger'

In memory of Kendrick Frazier

Several of my cases have involved my role as an "academic forger" (e.g., Nickell 2021; Nickell 2022a; Nickell 2022b).

All these and more have involved my work with questioned historical writings, photos, and artifacts, for which I have had an affinity since an early age. At about eight, I began (literally) to try my hand at calligraphy and also discovered I was a detective. Such are the myriad ways my childhood eventually developed into my even more expansive career: Ken Frazier has called me "the master solver of major popular mysteries" and Massimo Polidoro named me "the detective of the impossible."

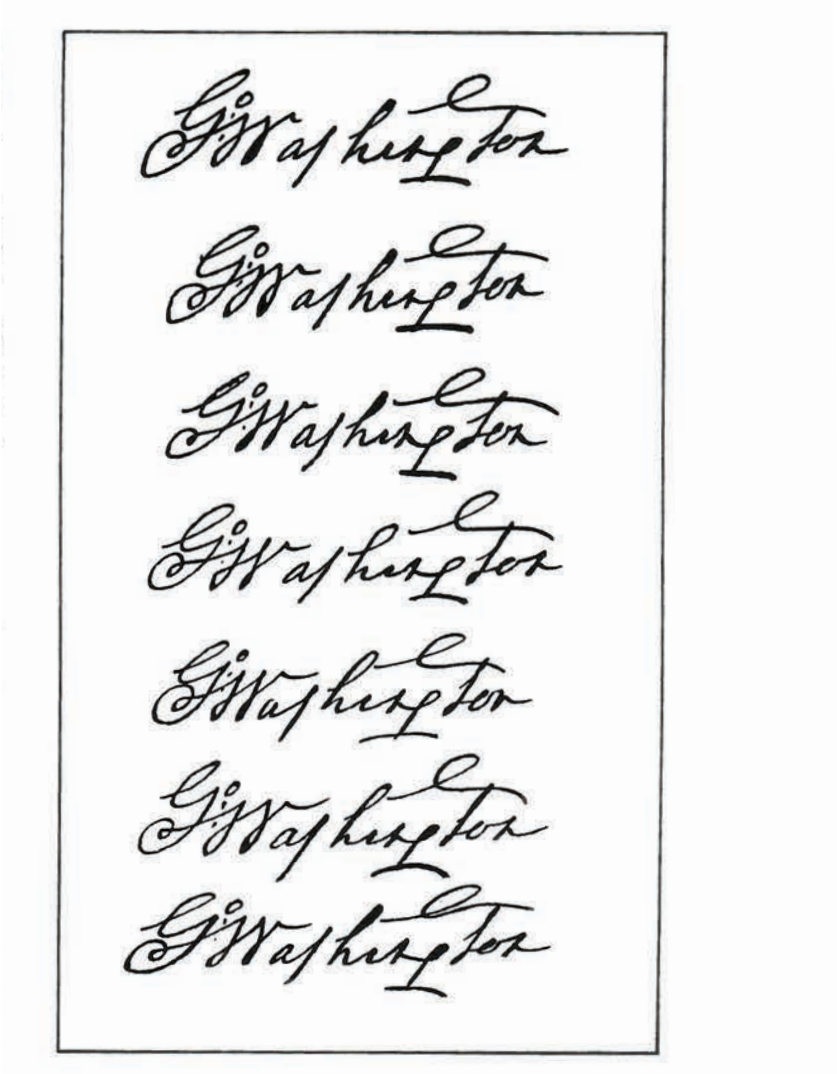


Figure 1. The author's forger's practice sheet for George Washington's signature.

Getting Started

Following my checkered career as a magician, Pinkerton detective, and more (including museum designer in the Yukon Territory), I returned to the University of Kentucky for graduate school in 1979 (eventually receiving my master's degree and doctorate, both in English). About that time, I had begun my extensive collecting of antique writing materials. Along the way, I learned to cut quill pens, concoct ink from oak galls, make handmade paper, and apply sealing wax—among numerous other old crafts. I practiced signing famous historical autographs (see Figure 1).

I combined skills to produce entire fake documents, giving them simulated antiquity through artificial aging techniques. I studied ancient writings, using ultraviolet light and other technologies to read faded or otherwise obscured texts, and scanned documents with a stereomicroscope to reveal more hidden clues. I studied genuine writings as well as the fakes I had made for experimental purposes. Having become friends with noted manuscript expert Charles Hamilton—author of such books as *Great Forgers and Famous Fakes* (1980)—I promised him that if he helped me learn to produce forgeries as a means of understanding how to better detect them, I would never turn to a life of crime.

Of course, I had in mind the adage "set a thief to catch a thief" (a role I had

often played as an undercover detective). When my book *Pen, Ink & Evidence* was published, Hamilton wrote a generous foreword (Nickell 1990). The book bore over 350 photographs, lovingly made by my late friend Robert H. van Outer from my collection (itself now at the University of Kentucky). I still regard the book as my masterpiece. Already, antique dealers, archivists, private collectors, and others wanted me to look at their questioned writings to authenticate them—or not, of course.

I also began to study old photographs, a pursuit that led to more cases and culminated in my *Camera Clues: A Handbook for Photographic Investigation* (1994); it was followed by *Detecting Forgery* (1996), *Unsolved History* (2005), and *Real or Fake* (2009). The last two books included the further related field of questioned artifacts. Some of my cases involved combinations of problems—for example, alleged *Titanic* artifacts with attached old hand-printed tags (Nickell 2009, 191–203).

In time, I would learn of someone who had a career parallel to mine. We were both studying old writings and acquiring esoteric skills—including the making of fake historical documents. His name was Mark W. Hofmann, but I did not learn of him right away. Whereas I was styling myself an "academic forger," he was doing his work in hiding, and his was a nefarious secret. His eye was motivated by greed, and his hand was guided by sociopathic tendencies. Hofmann had himself been a document dealer who attracted little attention, but that changed with his propensity for "discovering" sensational treasures. As I related previously, Hofmann's career ended with a life sentence for the bombing murders he committed in trying to cover up his forgeries. I assisted the prosecution in that case—especially by showing how Hofmann made and artificially aged iron-gallotannate ink (Nickell 2021).

America's Holy Grail?

Other cases followed, including the sensational appearance of a seemingly genuine copy of the Gettysburg Address! That is to say: Six score and seven years after Abraham Lincoln's famed oration, a copy of it had surfaced. Had the Holy Grail of American manuscripts been discovered at last, or was the document too good to be true?

One of only two confirmed photos of Lincoln (center, facing camera) at Gettysburg taken about noon on November 19, 1863; Lincoln spoke some three hours later. To Lincoln's right is Ward Hill Lamon, his bodyguard.

The first page was missing; however, the crucial second page contained not only the last eleven lines of text but also Lincoln's autograph on the verso (the back). It was addressed to the man whose home Lincoln stayed at when he gave the address at Gettysburg. It was even a sheet of light blue paper—ironically known to manuscript experts as "Lincoln blue" after the numerous legal pleadings Lincoln had written on just such paper.

The sheet was brought to me (then at the University of Kentucky) by noted Lincoln collector Lloyd Ostendorf. At first look, it certainly appeared genuine. To me, that meant it probably *was* genuine—or it was a very skillful fake made by someone like, well, Mark Hofmann. However, under ultraviolet light the paper brightly fluoresced—unlike both paper of that age generally and several sheets of Lincoln blue from my reference collection. Moreover, the fluorescence was spotty, which suggested the possibility of the paper having been resized (as by a forger for reuse) or subjected to a chemical application (to "age" the ink). Thus, early on I was very suspicious of the document.

Further suspicion came from anomalous folds in addition to the main ones. Here and there, some ink had spread into a fold, indicating that the paper had been folded before being written on. This suggested an old sheet had been recycled for this use, as did the fact that neither of the long edges of the paper was original. (For more, see Nickell 2009, 67–79.)

Among other observations, stereomicroscopic examination revealed considerable shakiness of line that I associate with "forger's tremor"; it is caused by writing being slowly drawn rather than swiftly penned. The inscription (on an outside panel of the folded sheet) had additional flaws, including uneven slant and occasional faulty pen pressure. The signature looked like Lincoln's but had an odd, second hump on the final *n*—a feature I had never seen on a genuine "*A. Lincoln*" signature (Nickell 2009, 70–72).

A most dramatic feature was that, if genuine, this copy of the address was the long-lost copy President Lincoln read

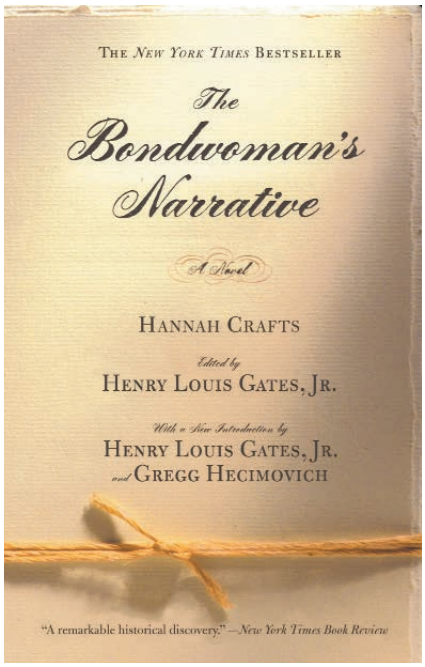
from at Gettysburg. We know (thanks to an Associated Press reporter who was there) that Lincoln actually spoke the words "under God," yet none of the other drafts and copies (six are known) include them. On the newly "discovered" Ostendorf copy, they are inserted with a caret. Ostendorf himself had noted that a transparency of the questioned writing will fit over the text of one of the others (the so-called Hay copy) with a remarkable coincidence of word configurations. Ostendorf thought this a good sign, but in fact the odds are that such a similarity was evidence of copying—most likely that of a skilled penman who used some freehand smoothness while, at the same time, tracing (Nickell 2009, 73).

Even with this very brief discussion, we can see that the document is an above average (if imperfect) forgery—a mixture of research, penmanship, and cleverness suggestive of Hofmann. Moreover, the ploy of "discovering" a known-but-lost document is a frequent trick of Hofmann, and I have concluded that the Ostendorf "draft" is probably another of his shrewd productions. To the few experts who disagree—who acknowledge it is a forgery but think Hofmann would never have engaged in tracing—I wish they could have examined the document as I did; I believe they would change their minds. Besides, in all the years since, I have come to ask: If it was not Hofmann, where is other work from this clever person?

Novel by an American Slave?

When a fascinating literary mystery surfaced in 2001—a novel purportedly penned by a fugitive slave before the Civil War—I was honored to be chosen as the literary sleuth to examine it. I was commissioned by Time Warner Trade Publishing (for whom I had exposed as an amateurish forgery the Jack the Ripper diary), and the manuscript was hand-carried to my laboratory by courier.

Owned by distinguished African American scholar Henry Louis Gates Jr.—of Harvard University and PBS television—the manuscript yielded a wealth of evidence. I studied the paper, ink, handwriting, and other traces for six



weeks. Carefully teasing out its secrets was the kind of work I had spent two decades preparing for with my doctorate (and dissertation on "literary investigation"), as well as my collection of antique writing materials and my hands-on "academic forger" experiments.

Of my subsequent findings (published as an appendix to *The Bondwoman's Narrative* in Crafts 2002), Gates (2002, xxx) wrote, "Nothing in my experience as a graduate student of English literature or a professor of literature for the past twenty-five years had prepared me for the depth of detail of the results of Nickell's examination nor for the sheer beauty of the rigors of his procedures and the subtleties of his conclusions." Of this extensive work I can only give a few examples here. I trust they will be illuminating (Nickell 2009, 53–66).

Paper. I obtained some small slivers of paper from the manuscript's frayed outer edges and teased them apart on a microscope slide, used appropriate stains, and observed the fibers microscopically. I identified rag—linen and cotton—fibers (the latter with their characteristic twist). However, I could find no evidence of ground wood pulp (first commercially available in North America in 1867).

Among other analyses, I used backlighting to examine each leaf of the manuscript and made a significant discovery: there were accidental translucent stitch-type markings across some leaves of the paper. I recognized these as having been caused by the seam of the screen-wire belt of an early paper machine. This also provided useful dating information.

Throughout, the paper consisted of sheets of stationery of four different types, two of which bore embossed stationers' crests (designs impressed in the upper-left corner of letter sheets). These began in the late 1830s, a fact that provided still further date significance. As was typical of such sheets, these came folded in half, thus yielding two leaves and four pages each. Such *folios* were subsequently gathered together and bound by sewing with needle and thread. (The manuscript was professionally bound sometime later, after about 1880.)

Pen. The entire manuscript was written with dip pens, as evidenced by writing sequences that became progressively lighter and then abruptly dark again as the pen was recharged with the ink. Sometimes the pen strokes became finer, indicating the quill was newly sharpened. (Quills were largely abandoned by the end of the Civil War.) Standard goose quills, rather than the smaller crow quills affected by many Victorian ladies to express femininity, were clearly used throughout.

Ink. I used a special technique I developed to transfer a small amount of ink onto chromatography paper for testing with chemical reagents. This revealed that the ink was a common iron-gallotannate ink lacking a provisional colorant. That was the main ink in use during the middle of the nineteenth century. Rarely in the manuscript, the ink was blotted with the application of writing sand; I found no use of the later blotting paper.

Handwriting. Throughout the manuscript, the script was modified round hand that dominated the period from about 1840 to 1865 (before being supplanted by the Spencerian system of 1865–1890). Obviously, handwriting cannot be precisely dated by style because people tend to continue their

I have learned to keep such snap judgments to myself, even though they are usually correct.

manner of writing into old age. Given that the various writing materials indicated that the manuscript had been penned in the 1850s, the absence of archaic forms (such as the long *s*) suggested that the writer had been relatively young. Here and there corrections were made by wiping off the wet ink with the little finger (a common practice of the quill pen era). This has given us the useful information that the author was right-handed.

The Text. Textual evidence in *The Bondwoman's Narrative* offered further information about the author and the date of composition. An admixture of good vocabulary skills and poor spelling suggest that the novelist had struggled to learn to write. The readability level was high and even showed borrowings from Charles Dickens's *Bleak House* (published in the United States in 1853). A search for the author has been made, and after years of study and searching, a scholar believes he has identified the author. His book is scheduled for publication in 2023. Because we have a copious quantity of the handwriting, I hope we may be able to confirm the identity.

Daniel Boones?

I will end with a few questioned "Daniel Boone" documents that illustrate the difference between first impressions and careful study.

One was in the possession of a distinguished jurist who had a Boone letter offered to him on approval: Should he buy it? I met him at the law library of his office suite, and as I began to unpack my stereomicroscope and other paraphernalia, he took the letter out of a briefcase and laid it on the other end of the long table. At a glance, I was pretty sure it was spurious. There was entirely too much wasted space around the skimpy text; I had never seen the frugal Boone use such a full sheet for such a brief text—and I had seen a lot of Boones. Then a glance at the handwriting revealed it was a poor imitation.

I have learned to keep such snap judgments to myself, even though they are usually correct. Closer inspection did not improve the credibility of the letter, which bore a date in 1816. Its torn edges appeared to be recent, consistent with having been removed from a book. Ultraviolet light revealed a rectangular area at the top, consistent with a slip of paper having been used as a bookmark! The writing exhibited blunt endings, and an unnatural uniformity of pressure (lack of contrasting hairline upstrokes and heavier downstrokes) gave it a slowly drawn appearance. As I compared the handwriting with facsimiles of Boone's I had brought with me, the jurist nodded in clear understanding with each point I made. "Once you know what to look for," he admitted, "it becomes obvious" (qtd. in Nickell 2009, 104).

A lesson here is that even suspicious writings may ultimately offer evidence of their own genuineness.

Another case involved a Boone letter sent to me as a photocopy from a top American document dealer. It had a good provenance, but he was not too familiar with Boone's handwriting. I told him, "With the caveat that one cannot authenticate a document from a photocopy (although one may well be able to disauthenticate one) the handwriting looks good to me as does the phonetic spelling." This was enough for an expert such as him, who mostly needed to make sure it was not in the handwriting of someone else—say, someone who might have written it for the frontiersman (Nickell 2009, 100–102).

Yet another case needed a careful investigation: It consisted of a sensational cache of thirteen Daniel Boone survey documents from the 1787 period! A hush-hush status on the provenance, together with the sheer quantity, made me suspect a forgery factory. These were not spot-them-across-the-room fakes, however. As I would soon see, the paper was absolutely genuine, and the handwriting was penned with a quill in a perfect flowing rendition of Boone's own hand. Other details finally informed me that the documents were genuine without doubt. As to the questioned provenance, it turned out that the elderly owner's family had been secretly selling his collection to pay for his care. A lesson here is that even suspicious writings may ultimately offer evidence of their own genuineness. (See Nickell 2009, 100–106; Nickell 1990, 166.)

Let us end here with a "document" as simple as an old tree in Louisville, Kentucky—inscribed "D. Boone. Kill a Bar. 1803." It was revealed as spurious on the basis of the date alone: In that year, Daniel Boone was serving as a magistrate in Missouri having already lived there a few years. He did not return to Kentucky until about 1810 (Nickell 1990, 182). ■

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Undercover in a Madhouse: The Extraordinary Story of Nellie Bly

In September 1887, New York newspapers published the story of a lost girl who was behaving strangely and was about to be locked up in Blackwell's Island, the asylum of the city.

The *New York Times* spoke of the girl's face as "almost haggard in its paleness" and talked of the "wild, hunted look in her eyes." According to the same *Times* article, "When asked if she did not wish to find her friends, she nodded affirmatively, but said wearily, 'I can't remember, I can't remember" ("In and about the City" 1887). Anyone who might know her was beseeched to come and get her, but no one showed up to claim her. The girl was then sent to Bellevue Hospital for examination and then on to the asylum.

There was only one newspaper that had not mentioned the story of the mysterious girl or asked for those who knew her to come forward: *New York World*. This was for a very simple reason; its editors knew that any appeal was futile. They knew this because the girl judged demented beyond hope of recovery was actually Nellie Bly, a perfectly sane reporter for *New York World* who was pretending to be insane to investigate conditions at the asylum.

Nellie Bly (pseudonym of Elizabeth Cochrane Seaman) (1867–1922)

Though true, the story of Nellie Bly is truly incredible, not only because a woman reporter in the second half of the nineteenth century was a rarity but also because her whole life reads like an adventure novel full of twists and turns, great fortunes won and lost, betrayals, and exceptional feats.

Elizabeth Jane Cochran—Bly's real name—was the daughter of an ostensibly relatively wealthy country judge. But the judge's sudden death revealed he wasn't actually able to provide for his family. His family, including Elizabeth, was effectively forced to sell the family home and move to a poor neighborhood, which prevented Elizabeth from pursuing the studies she had dreamed of.

An article in the *Pittsburgh Dispatch* at the time argued that women belonged in the domestic sphere and their main task was to look after the family, cook, and sew. This article ignited Cochran's spirit as an enterprising young woman. She did not accept being locked into the stereotype of the angel of the hearth. Cochran, who felt strongly stifled by the lack of opportunities for young women, wrote a letter of protest to the newspaper in which she described the obstacles faced by poorer women who sought to have a role in society beyond the household. She signed it as "Little Orphan."

Cochran's clear and direct writing impressed the newspaper's editor, who tried to get in touch with the anonymous author by publishing an ad in his

newspaper inviting the letter-writer to contact the editorial staff.

Cochran immediately responded by sending the newspaper an article about discrimination against women in the workplace. The editor liked it, and once it was published the public reacted by flooding the newspaper with letters. He then asked her if they could meet, and only then did he discover that Cochran was female. After her new article on the subject of divorce provoked a reaction of enormous interest from readers, he proposed hiring her, turning her into the first woman working at his newspaper.

Under the arguably more endearing pseudonym of Nellie Bly, which was also the title of a popular song, Cochran's extraordinary journalistic career began. She wrote articles exposing prison conditions, disguised herself for an undercover investigation to report on living conditions in factories, and went to Mexico and chronicled the rampant corruption there.

That trip to Mexico cost her dearly, however. Upon her return she discovered that she had been reassigned to the role of "society life" reporter; beauty contests, flower shows, and theater reviews took the place of her beloved investigations.

Disappointment did not take over for her though. Cochran left Pittsburgh for New York, wanting to work at *New York World*, one of the city's most important newspapers. One thing stood in her way: the paper's editor, Colonel John Cockerill, thought the idea of a woman reporter was impractical and far-fetched beyond words.

Desperate but not tame, Cochran proposed two ideas for striking articles to the Colonel. The first was that she would travel to Europe and return in third class so as to chronicle the plight of the emigrant. The second was to pretend to be insane to be admitted to the notorious women's asylum on Blackwell's Island.

And that was precisely where Colonel Cockerill sent her—to the asylum!

Cochran prepared very carefully, first going to the deputy district attorney to secure immunity from possible prosecution and then making arrangements with the warden to be released if she succeeded in her efforts to get herself locked up.

When everything was ready, she showed up dressed in rags at a house that rented beds by the night. She immediately began behaving in a "strange" manner; an obvious state of confusion, a catatonic look, and sudden screams soon prompted others to call the authorities.

In the courtroom, the judge ordered her hospitalization. After a very superficial checkup at Bellevue Hospital, the doctor who examined her judged her to be demented. Not only that, but he mistook the dilation of her pupils due to her myopia for the symptoms of drug addiction.

Thus, after just one night in the hospital, Cochran was transported to Blackwell's Island, an asylum where women considered insane or mentally challenged—or who the authorities just didn't know how to deal with—were locked up. She got out ten days later thanks to the intervention of newspaper colleagues who showed up claiming to be her family members and asking to be allowed to take her home.

In those very long ten days, Cochran discovered firsthand how the women inmates were treated. They were forced to sleep on hard beds with high sides covered only by a tarp. They were awakened at 5:30 in the morning each day and then made to sit on hard wooden benches in a frigid room, in silence, until eight o'clock at night.

Cochran's first investigation, titled "10 Days in an Asylum," revealed the inhumane conditions in which 1,600 women were kept on the island. In addition to the bench torture, it was recounted that the food (bland tea, dry bread, rancid butter, unseasoned meat, and slop) caused vomiting in almost all the inmates. Hygienic conditions were kept to a minimum; bathing consisted of an icy bucket, soap was available only once a week, and clothes were changed only once a month. The women then were subjected to constant violence: slaps whenever they did not stand in line, cruel jokes, and beatings when they disobeyed.

Cochran concluded her report with these words: "Blackwell's Island Asylum is a human mousetrap. It is easy to get in but once there it is impossible to get out."

The investigation caused quite a stir in the public opinion of the time. Other newspapers quoted the *New York World* piece extensively, and a grand jury investigation confirmed its findings. This led the city of New York to allocate a million dollars for the care of the mentally ill.

Cochran was offered a lecture series, and her articles were turned into a book. But the greatest reward was the job she had so long dreamed of: news reporter for a New York newspaper.

She thus began to write increasingly explosive stories. She posed as a waitress looking for work to show how employment agencies exploited maids; a single mother with an unwanted child to reveal the trafficking of newborns; a lonely heart in search of a husband to investigate the shady practices of marriage agencies; a prostitute to document conditions at a home for lost women; an innocent country girl to expose Charles Cleveland, an unsavory character who went around Central Park picking up newly arrived girls from rural areas, inducting them into slavery as prostitutes—with police approval.

Another exceptional feat Cochran undertook was a trip around the world in less than eighty days, surpassing the fictional record imagined by Jules Verne in his famous novel. Where did the exceptionality of this lie? In the fact that it was a woman accomplishing this feat—and an unaccompanied one at that! Seventy-two days, six hours, eleven minutes, and fourteen seconds after her departure, Cochran made her return to the city, becoming America's best-known reporter.

Elizabeth Jane Cochran—better known by her pen name, Nellie Bly—was an extraordinary figure, but she has sadly been forgotten by most. She understood better than many of her colleagues the deeper purpose of investigative journalism: to write about certain matters so that we can change them. ■

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[THE PHILOSOPHER'S CORNER

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Fake News as Noxious Markets?

We've all heard of fake news. But what exactly are we talking about? Allcott and Gentzkow (2017) define *fake news* as articles that are "intentionally and verifiably false," for instance the "news" in 2016 that Pope Francis had endorsed Donald Trump for the U.S. presidency. Despite somewhat natural disbelief that anyone could actually take such "news" seriously, plenty of people did. And, as a consequence, at least some of them were reinforced in their belief that voting for Trump was, in fact, a good idea. I mean if the Pope says it!

Because fake news is, ahem, a real thing, the question obviously arises: What are we going to do about it? Many skeptics have argued that we need to teach critical thinking. In a complementary fashion, some philosophers have suggested that we should put more emphasis on "epistemic virtues," i.e., on nurturing people's respect for truth and the sort of behaviors that are truth-conducive (Pigliucci 2021).

Megan Fritts and Frank Cabrera—respectively from the University of Arkansas, Little Rock, and the University of Wisconsin, Madison—have a different opinion. In a paper they wrote for the *Journal of the American Philosophical Association*, they suggest that the critical thinking/virtue epistemology approach doesn't work and that fake news should instead be treated as a noxious market and therefore heavily regulated or shut down altogether (Fritts and Cabrera 2022).

A "noxious market" is one that (1) causes individual harm; (2) causes societal harm; (3) involves or requires weak agency on the part of participants; and/or (4) plays on deep vulnerabilities of participants (Satz 2010). According to philosopher Debra Satz, a market of this kind may be restricted when it inhibits citizens from being able to stand in an equal relationship with one another and the problem cannot be solved without restrictions (Satz 2010).

Examples of noxious markets include human body parts, child labor, toxic waste, sex, and life-saving medicines, though of course people disagree about whether all or only some such markets ought to be considered noxious and restricted or prohibited. I gather that few would disagree that child labor qualifies as a noxious market and should simply not be allowed. But some libertarians claim that consensual trafficking in human body parts is admissible, on the grounds that my kidneys are mine to dispose of. And several feminists see no problem at all with sex work, so long as the rights and safety of the workers are safeguarded.

Fake news is a market because creators of fake news make money out of advertisement driven by online traffic, mostly on social media. Moreover, social media moguls themselves make a profit out of the information they get (and resell) about consumers of fake news. According to Fritts and Cabrera, fake news markets cause harm at least along the first two dimensions identified by

Satz and therefore qualify as noxious markets.

Fritts and Cabrera's paper is of crucial relevance to skepticism, because it raises several questions we all ought to carefully think about. First, are the authors correct that teaching critical thinking and casting things in terms of virtue epistemology is ineffective and unhelpful? Second, are they right that fake news constitutes a noxious market? Third, should we seek to shut down, or at least heavily regulate, the fake news market?

Let's begin with the idea that we should be teaching people about critical thinking with the aim to make them more epistemically virtuous or, at least, less epistemically vicious. Critical thinking has to do with seeking the truth, properly evaluating evidence, assessing arguments, honestly doing research, and several other character traits that fall under the general heading of epistemic virtues.

But Fritts and Cabrera actually doubt that the reason for the epidemic of fake news is widespread epistemic vice. In fact, they think that consumers of fake news can be modeled as respecting the rules of inductive and deductive inference. Perhaps they can, in some cases. For instance, it is possible that a conspiracy theorist legitimately and logically deduces his conclusion that the 2020 U.S. election was stolen by Joe Biden from certain premises concerning the mechanics of elections, the motives of members of the Democratic Party, the way voting machines work, and so forth. That is, it is conceivable—though I don't think likely—that such a conspiracy theorist would correctly use the rules of inference given certain premises.

But the problem, in that case, would lie in one or more of the premises. If one begins with incorrect premises, one can "logically" arrive at all sorts of wrong conclusions by way of valid reasoning. Garbage in, garbage out, as computer programmers say. And failing to critically assess one's premises, not properly checking the evidence that supports them, is a very serious epistemic vice. So, no, I don't think that consumers of fake news are virtuous epistemic agents.

Fritts and Cabrera go on to point out that "the other side" has also gotten into the business of teaching "critical thinking," citing the example of a fundamentalist church that offers one such course.[1] But arguing that critical thinking is not a good thing just because someone who clearly does not practice it nevertheless attempts to ape it is utterly unconvincing. By that token, we should drop our support for science on the grounds that some people engage in "creation science." Surely that is entirely irrelevant.

Moreover, Fritts and Cabrera claim that an epistemically vicious person is the least likely to respond to being taught virtue, so skeptics would quickly find themselves simply preaching to the converts. Setting aside that—as any good pastor knows—preaching to the converts is actually a very effective practice, by that standard why do we bother teaching anything to anyone who isn't already interested? We do so because we attempt to *stimulate* interest where there was none before or even where there was hostility based on ignorance and fear.

One valid objection brought up by Fritts and Cabrera is that the empirical evidence is mixed as to the actual effectiveness of teaching critical thinking. This is true, but a quick search on Google Scholar reveals why: *critical thinking* is a very broad, and somewhat vague, umbrella term, which means that it is taught in a variety of manners, some of which will be effective and some not. Moreover, there are many variables that affect the effectiveness of teaching critical thinking, including the age of the students, the academic setting, the approach used by the teacher, the students' background socio-economic factors, and so on. None of this means that we should give up on the idea, though. It just means that we shouldn't expect miracles and that we should keep studying, on empirical grounds, what does and does not work.

Regarding the second question at issue—whether fake news is, in fact, an example of a noxious market—I think the point is debatable. Even markets that fit the definition of noxious as articulated by Satz may reasonably be considered not sufficiently problematic to justify intervention. Is the market for fake news more like the one for sex work or more like that for child labor? At the moment, I feel fairly agnostic on the question, and I think it would be reasonable to have further evidence-based discussions on the matter.

Finally, should we aggressively regulate or even shut down the fake news market? One way to consider the possibility is by examining how Fritts and Cabrera would go about doing it. They advocate the elimination of article 230 of the Communications Decency Act, which the Electronic Frontier Foundation has called "the most important law protecting Internet speech." Article 230 states that "No provider or user of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider." It is worth noting that former President Trump is in favor of repealing 230 so he and his cronies can sue several websites for alleged censorship and defamation.

Of course, just because Trump supports an idea doesn't mean that the idea itself is bad. But we ought at least to pause and consider things more carefully. Any time we advocate for legal restraints on free speech, we are embarking on a treacherous path. I hope we can all agree that curtailing speech should be a remedy of last resort and one that needs to be evaluated for effectiveness as rigorously as, or in fact even more rigorously than, any other alternative on the table. ■

Note

1. See: https://canvas.instructure.com/courses/766248/assignments/syllabus.

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[REALITY IS THE BEST MEDICINE

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Antioxidants: The Hype and the Reality

Everyone is talking about antioxidants, but misconceptions abound. For example, I just received an email that described antioxidants as "the ability to soak up toxins in the body." One dictionary definition of an antioxidant is "(1) a substance that inhibits oxidation, especially one used to counteract the deterioration of stored food products [and] (2) a substance such as vitamin C or E that removes potentially damaging oxidizing agents in a living organism."

First, what is oxidation? It is the loss of electrons during a chemical reaction and may not involve oxygen at all. It's the opposite of reduction, where electrons are gained. In redox reactions, oxidation and reduction occur simultaneously when an electron is transferred from one place to another.

Free Radicals

Two other terms that are frequently mentioned along with antioxidants are *free radicals* and *oxidative stress*. Free radicals are unstable molecules that are missing an electron from their outer shell. They react readily with other molecules that can give up an electron to replace the one that is missing. Most of them have short lifetimes. Free radicals are produced naturally in the body. They can also result from ionizing radiation, heat, electrical discharges, electrolysis, smoking, alcohol, and stress. Some free radicals are necessary for life. One important function is the killing of bacteria by phagocytic cells. But they can cause harm. They have been implicated in many diseases, including Parkinson's disease, Alzheimer's disease, schizophrenia, hemochromatosis, cancer, asthma, diabetes, degenerative joint disease, senile

dementia, and degenerative eye disease, as well as aging. The body produces its own antioxidants to repair the damage caused by free radicals. When free radicals accumulate in excess of the body's ability to destroy them, the result is called oxidative stress.

Recommendations for Foods High in Antioxidants

Research has not shown health benefits from antioxidant supplements, so we are advised to get our antioxidants from dietary sources. Commonly recommended foods that are said to be good sources of antioxidants include blueberries, dark chocolate, artichokes, pecans, strawberries, red cabbage, raspberries, beans, red grapes, spinach, beets, kale, and orange vegetables (e.g., sweet potatoes, squash, and carrots). But other lists include a great variety of other foods, from coffee and green tea to red wine, mangos, lean meat, milk, onions, fish, seafood, and nuts. The Better Health Channel, a service of the State of Victoria in Australia, says "Research is divided over whether antioxidant supplements offer the same health benefits as antioxidants in foods" (Better Health Channel n.d.) Then it provides a long list of good food sources of specific antioxidants and ends by recommending we eat a variety of foods from the five main food groups: vegetables and legumes, fruits, whole grain foods and cereals, lean meat (including poultry and alternatives such as fish, eggs, tofu, legumes, nuts, and seeds), and dairy and dairy alternatives, mostly low fat. This is essentially the standard dietary advice for healthy eating in general.

Every source I could find recommended getting our antioxidants from food rather than from supplements, but the National Institutes of Health (NIH) offered a word of caution:

> Research has shown that people who eat more vegetables and fruits have lower risks of several diseases; however, it is not clear whether these results are related to the amount of antioxidants in vegetables and fruits, to other components of these foods, to other factors in people's diets, or to other lifestyle choices. (National Center for Complementary and Integrative Health 2013)

For instance, people who eat more antioxidant-rich foods might be more likely to exercise and less likely to smoke. So antioxidants from foods may not be beneficial either.

Results of Studies

Laboratory experiments showed that antioxidants interact with free radicals to stabilize them and prevent them from causing cell damage.

Double-blind clinical trials tell a different story. Antioxidants are largely ineffective in preventing disease and often cause harm (National Center for Complementary and Integrative Health 2013):

Beta carotene not only failed to reduce the risk of cancer and cardiovascular disease, but it increased the risk of lung cancer in smokers.

In the Women's Health Study, vitamin E failed to reduce the risk of heart attack, stroke, cancer, age-related macular degeneration, or cataracts and did not reduce the overall death rate.

The Women's Antioxidant Cardiovascular Study looked at several antioxidant supplements (vitamin C, vitamin E, and beta-carotene) in high-risk women and found no reduction in the risk of cardiovascular events, diabetes, or cancer and no slowing of changes in cognitive function in the elderly.

The Physician's Health Study II found no decrease in the risk of cardiovascular events, cancer, or cataracts with supplemental vitamin C or E, but it did find an increased risk of hemorrhagic stroke.

The SELECT trial showed that selenium and vitamin E did not prevent prostate cancer. On the contrary, vitamin E taken alone increased the risk of prostate cancer by 17 percent.

Most clinical trial results were negative, but not all of them. The AREDS2 Study found that lutein and zeaxanthin reduced the rate of progression of age-related macular degeneration without increasing cancer risk (National Center for Complementary and Integrative Health 2013).

In a 2018 review of "oxidative stress, aging, and diseases" the authors cautioned: "antioxidant therapy could positively affect the natural history of several diseases, but further investigation is needed to evaluate the real efficacy of these therapeutic interventions" (Liguori et al. 2018).

Yes! That's a key insight that goes a long way toward explaining the large discrepancy between the hype about antioxidants and the actual evidence. The antioxidant story is appealing and internally coherent, but it's based largely on theory and speculation rather than on actual clinical results. It is logical that antioxidants should reduce the risk of many diseases, but when rigorously tested that doesn't pan out. It may be that free radicals are present in those diseases but in such small amounts that their contribution to causation is minimal or nonexistent.

What Are Some Antioxidants?

An article from Harvard Medical School lists these:

> ***Vitamin C:*** Broccoli, Brussels sprouts, cantaloupe, cauliflower, grapefruit, leafy greens (turnip, mustard, beet, collards), honeydew, kale, kiwi, lemon, orange, papaya, snow peas, strawberries, sweet potato, tomatoes, and bell peppers (all colors)
>
> ***Vitamin E:*** Almonds, avocado, Swiss chard, leafy greens (beet, mustard, turnip), peanuts, red peppers, spinach (boiled), and sunflower seeds
>
> ***Carotenoids including beta-carotene and lycopene:*** Apricots, asparagus, beets, broccoli, cantaloupe, carrots, bell peppers, kale, mangos, turnip and collard greens, oranges, peaches, pink grapefruit, pumpkin, winter squash, spinach, sweet potato, tangerines, tomatoes, and watermelon
>
> ***Selenium:*** Brazil nuts, fish, shellfish, beef, poultry, barley, brown rice
>
> ***Zinc:*** Beef, poultry, oysters, shrimp, sesame seeds, pumpkin seeds, chickpeas, lentils, cashews, fortified cereals
>
> ***Phenolic compounds:*** Quercetin (apples, red wine, onions), catechins (tea, cocoa, berries), resveratrol (red and white wine, grapes, peanuts, berries), coumaric acid (spices, berries), anthocyanins (blueberries, strawberries). (Harvard T.H. Chan School of Public Health n.d.)

Other lists include a variety of other foods said to be antioxidants. It leaves one to wonder if any food is *not* an antioxidant. And good news for those of us who love coffee: coffee is said to be a major source of antioxidants in people's daily diets.

The information is far from straightforward. Under some circumstances, antioxidants can even act as pro-oxidants.

I Was Fooled

As I began by saying, there are a lot of misconceptions about antioxidants. I, too, was a victim of the hype. I had seen so much information about free radicals and antioxidants that the sheer volume made me think there must be something to it. As I started to question the hype and look for the scientific evidence, I quickly realized that there wasn't much to be found. Antioxidant supplements are largely ineffective and eating antioxidant foods is also largely ineffective. Neither seems to reduce the risk of diseases said to be caused by free radicals and oxidative stress.

The confusion is understandable. The foods that are high in antioxidants also happen to be part of the commonly recommended healthy diet. Eating blueberries is good for our health—not because of the antioxidants they contain but because of their many other components.

Conclusion: A Lot of Hype, Little Evidence

I was a believer, but now I'm a skeptic. Antioxidant supplements don't work, and neither do diets high in antioxidants. I don't think we should waste our time thinking about the antioxidant content of our foods. Our best bet is to eat a varied diet that conforms to the widely publicized standard evidence-based guidelines for healthy eating. ■

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[BEHAVIOR & BELIEF STUART VYSE

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Autism Politics and the Death of Truth and Freedom

Among the hot-button issues of the current era is the nature of autism and the way people with this disorder should be treated. Due to the introduction of autism spectrum disorder (ASD) in the 2013 edition of the American Psychiatric Association's *Diagnostic and Statistical Manual* (2013), children and adults who previously would have been diagnosed with the relatively mild Asperger's syndrome are now considered on the autism spectrum. Furthermore, in recent years some of these individuals with milder forms of autism have embraced the autistic label and established a disability rights movement on their own behalf. One of the principles of this movement is that, although autism is a psychiatric disorder, it should not be treated with therapy or medicine like other disorders. The foremost organizational representative of this movement is the Autistic Self Advocacy Network (ASAN), whose "What We Believe" section of their website claims that autism cannot and should not be cured (Autistic Self Advocacy Network n.d.). One of the implications of this philosophy is that ASAN is opposed to the use of applied behavior analysis (ABA), the most popular and arguably the most evidence-based treatment for autism. What has resulted from this circumstance is an object lesson in how a social justice movement can contaminate the search for truth at the expense of liberty.

Applied Behavior Analysis

Applied behavior analysis (ABA) is a form of therapy that uses rewards—reinforcement—and (very rarely) punishments to encourage adaptive behavior and discourage harmful or maladaptive behavior. It derives from the science of behavior developed by American psychologist B.F. Skinner, and it has been applied to the education and training of autistic children and adults for over fifty years. There is extensive research literature supporting its effectiveness, and it is one of the treatment options for autism listed by the Centers for Disease Control and Prevention (CDC). According to the CDC website, "Behavioral approaches [which include ABA] have the most evidence for treating symptoms of ASD. They have become widely accepted among educators and healthcare professionals and are used in many schools and treatment clinics" (Centers for Disease Control and Prevention 2022). Due to its reputation for effectiveness, ABA has become the most popular form of autism treatment in the United States. A 2016 study found that approximately 70 percent of children between the ages of three and seventeen with autism spectrum disorder had received some manner of ABA, either alone or in combination with medical treatment (Xu et al. 2019).

NeuroDivergent Rebel (they/them/Xe/Xem) ... @NeuroR... · Aug 28
The findings include: Autistic adults remember traumatic events from applied behavior analysis, do not believe that they should be made to behave like their peers, gained some benefits but suffered significant negative long-term consequences.
autism
journals.sagepub.com
Autistic experiences of applied behavior analysis - Laura K Anderson, ...
Autism spectrum disorder is a developmental disability affecting individuals across their entire lifespan. Autistic individuals have ...
4
48
90

A tweet that @NeuroRebel sent out to their 39.7 thousand followers

Caveat

Most of this column will be a discussion of the recent journal article "Autistic Experiences of Applied Behavior Analysis" by Laura K. Anderson (2022). But before I begin, I want to say that I do not entirely blame the author for its weaknesses. When I emailed her to obtain a copy of the article, she very graciously sent one, and according to her attribution in the article, she does not yet have a PhD. Assuming that she is relatively new to academic publishing, I place most of the blame for what follows on the editor and reviewers at the journal *Autism*. As you will see, they espouse a philosophy that may have contributed to what follows.

Phenomenological Research

The title of the article suggests a very broad goal, and the author's stated purpose does nothing to narrow it down: "This study is designed to gain an understanding of what autistic adults perceive as the costs and benefits of ABA interventions, how they feel about the ABA interventions they received, and what recommendations autistic adults have for the future of ABA" (Anderson 2022, 3). To skip to the bottom line, the researcher found that all participants except one "described their experience with ABA as abusive or traumatic." Some of participants noted some benefits gained from ABA, but "all participants expressed that ABA is an unethical intervention" (Anderson 2022, 6). This sounds pretty bad, and this is the message that was put out on twitter when the study landed. But let's look a little closer.

The author describes this as a phenomenological study, which is a type of qualitative research that, according to *Qualitative Inquiry & Research Design* by John Creswell and Cheryl Poth, "describes the common meaning for several individuals of their lived experience of a concept or phenomenon" (Creswell and Poth 2018, 121). As an example of a phenomenological study, Creswell and Poth point to an investigation of the experiences of AIDS patients by Elizabeth H. Anderson and Margaret Hull Spencer (2002). Anderson and Spencer solicited participants from a hospital-based clinic, a long-term care facility, and a residence. They recruited fifty-eight participants with AIDS, interviewed them about their experiences, and transcribed the tapes of the interviews. Finally, the researchers read through the interviews and identified common themes.

My Critique

Although I have not done qualitative research of this type, it has obvious value in describing human experiences; however, in my view, Laura K. Anderson's (2022) study of people who were treated with ABA has many weaknesses.

First, autism is now a highly politicized issue, and rather than taking this into account, Anderson seems to have leaned into the politics, emphasizing a particular point of view. In an effort to find people to interview about their experiences with ABA, she went to four sources, two of which were "Facebook websites for the Autistic Self-Advocacy Network (ASAN) and Academic Autism Spectrum Partnership in Research and Education (AASPIRE)." As previously stated, ASAN opposes the use of ABA, and although AASPIRE does not appear to have a stated policy on ABA, its website indicates that it "has a long-standing relationship with the Autistic Self-Advocacy Network" (Academic Autism Spectrum Partnership in Research and Education n.d.). It seems reasonable to assume that people responding to requests on these websites would be far more likely to have negative views of ABA than your average ABA graduate. In addition, the article

makes no mention of how many of the participants came from each of the four sources, so it is possible that all the people interviewed were found through the ASAN Facebook page.

Second, the study reports the results of interviews with only *seven people*! But wait. It gets worse. The author describes her participants as "seven autistic adults ages 18-27" (Anderson 2022, 4); however, we don't know if this really describes all their ages because one person declined to provide demographic information. Worse yet, no fewer than three of the participants—42 percent of the sample—*declined to report a diagnosis*. The other four participants reported diagnoses that fall under the current autism spectrum disorder rubric. So, we know that all seven of the participants remembered receiving ABA therapy, but it is unclear how the author can identify them as autistic adults given that three of them did not report a diagnosis. Given the highly political nature of the topic, a sample of just seven participants seems dramatically inadequate. Recall that Anderson and Spencer's (2002) study of AIDS sufferers employed fifty-

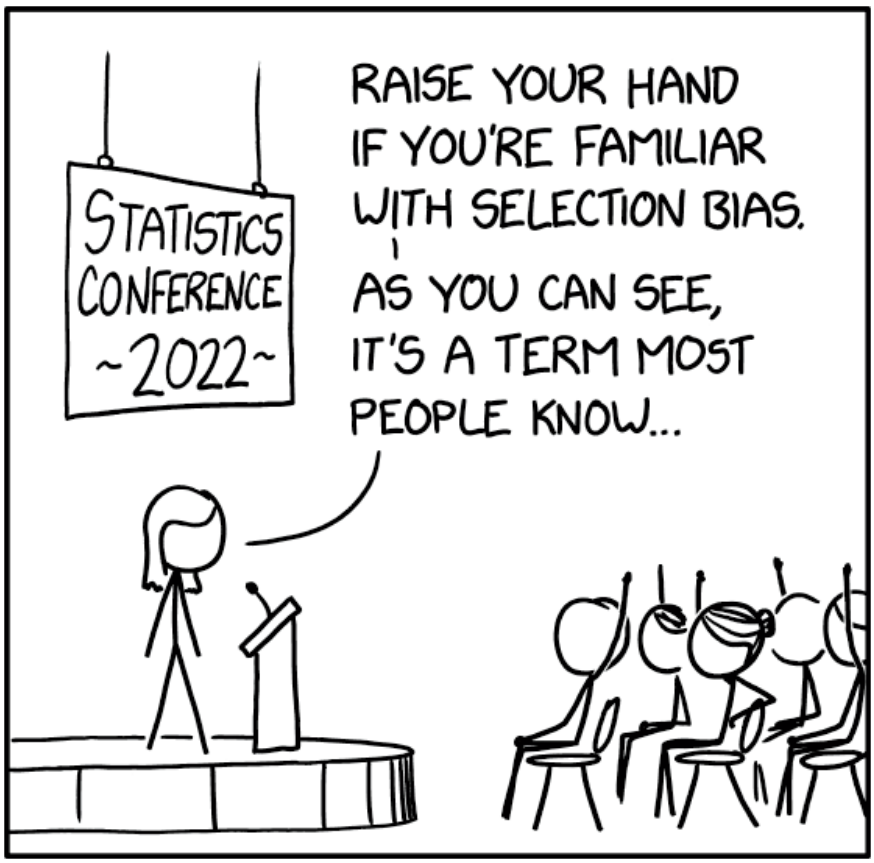
STATISTICS CONFERENCE ~2022~
RAISE YOUR HAND IF YOU'RE FAMILIAR WITH SELECTION BIAS.
AS YOU CAN SEE, IT'S A TERM MOST PEOPLE KNOW...

Figure 1. An xkcd comic about selection bias, which involves the selection of a sample of people (in this case, from statistics conference attendees) in such a way that they are not representative of the larger group they are supposed to represent (most people). (Source: xkcd.com.)

Kayleigh Norton, applied behavior analysis therapist, reviews numbers with a six-year-old boy. (Source: U.S. National Archives and Records Administration)

eight participants who described the far less controversial question of how they experienced their disease and the healthcare problems they encountered.

Third, by definition, this study was restricted to people who were able to give consent (i.e., not under guardianship) and had sufficient verbal fluency to conduct a live interview or write out their answers to the interviewer's questions—yet another dimension of selection bias. According to recent estimates, approximately 30 percent of children with autism will fail to develop spoken language (Tager-Flusberg and Kasari 2013), so a large portion of the universe of people with autism was not represented. Arguably, these individuals at the more severe end of the autism spectrum have the greatest need of ABA and have the greatest potential for benefit. But their views could not be reported by the participants of this study.

Fourth, there is the memory problem. All the participants were adults who were reporting what they recalled about ABA therapy they had encountered many years prior. It is not possible to calculate how long it had been since two of the participants received ABA, because one did not report his current age and another did not remember when they had received ABA. But for the remaining five participants, the time between the last exposure to ABA and their interviews was between thirteen and 17.5 years. In addition, the ages at which they reported last receiving ABA therapy ranged from 4.5 years old to eighth grade (approximately thirteen years old). As psychologist Elizabeth Loftus (2003) and others have made abundantly clear, memory is remarkably malleable. Far from being indelible photographs, our memories can be shaped over time and influenced by the subtle suggestions of others. It seems to me that memories from childhood might be particularly foggy. Finally, if a person cannot remember when they had ABA therapy, it seems reasonable that their memories of the therapy itself might also be unreliable, but this participant's results were included in the study nonetheless.

I could go on, but these are the main flaws I see in Anderson's (2022) study. I find it particularly disingenuous for the article to be published with the sweepingly general title "Autistic Experiences of Applied Behavior Analysis." The author's conclusion is equally broad: "Overwhelmingly, the largest implication for the practice of ABA is that there is a risk of genuine long-term harm to people who receive ABA" (Anderson 2022, 12). ABA has been used with hundreds of thousands of people, and without question some abuses have happened. Medicine, psychiatry, and many professions have also had cases of reported abuse. But Anderson (2022) does not modify the word *risk*. The reader is left to guess whether it is a "vanishingly small risk" or a "substantial risk." Of course, this study cannot hope to determine the level of risk, because its sample of individuals was far from representative. Risk is a *quantitative* concept, and this is a *qualitative* study. It was not designed to measure risk, yet its author wants to have it both ways. As an analogy, imagine a study of mothers' attitudes about guns in America based on the responses of seven mothers found through the Facebook page of the Coalition to Stop Gun Violence and published with the title "Mothers' Opinions about Guns in America." Such a study would say very little about the larger group of American mothers and their thoughts about guns.

As mentioned above, Anderson does not reveal how many of her participants came from anti-ABA websites, and she makes no acknowledgement that her participants were exclusively on the higher-functioning end of the autism spectrum. It is common now for authors to include a "Limitations" section near the end of a research article, in which they outline any qualifications that apply to their findings and caution against overgeneralization. Anderson (2022) did not include a limitations section in her article, and the seeds of overgeneralization seem to have been quite intentionally planted. Perhaps this column might serve as her limitations section.

How Did This Happen?

In case it is not already obvious, I believe this article should never have been accepted for publication in this form. The journal *Autism* is published by Sage Publishing, a large and long-standing publisher of academic journals, but in my view, this article is an embarrassment for both the journal and the publisher. So, how did this happen?

I don't know for certain; however, there is an obvious possibility that this article was accepted because it was in alignment with the editors' biases. The publisher's website says *Autism* "is a major, peer-reviewed, international journal, published 8 times a year, publishing research of direct and practical relevance to help improve the quality of life for individuals with autism or autism-related disorders." However, it is published in association with the National Autistic Society (NAS), an advocacy group in the United Kingdom that, among other things, runs seven schools for children with autism. A section of their website, titled "What We Think About ABA," lays out a negative view: "We believe that some ABA interventions used today are not sufficiently person-centred and are too intensive" (National Autistic Society n.d.). The NAS has also endorsed a view advocated by autism self-advocates that autism

should be accepted and not changed: "We also do not support interventions of any kind that use punishment or try to make people 'less autistic'. That is wrong and it is impossible to make someone less autistic."

First, punishment is rarely used in ABA. The Ethics Code of the Behavior Analysts Certification Board states that behavior analysts (therapists who administer ABA) "recommend and implement restrictive or punishment-based procedures only after demonstrating that desired results have not been obtained using less intrusive means, or when it is determined by an existing intervention team that the risk of harm to the client outweighs the risk associated with the behavior-change intervention" (Behavior Analyst Certification Board 2020, 12). ABA therapists who violate the Ethics Code can have their board certification revoked, which will often result in loss of employment.

Second, NAS's philosophy that people cannot be made less autistic may be fine for those who would previously have been diagnosed with Asperger's syndrome, but it will not be readily accepted by many parents of autistic children at the opposite end of the spectrum, children who are non-speaking, incontinent, bite themselves, and attack their teachers and other students. It will be hard for those parents to accept—and indeed it is factually wrong—that their children cannot learn to be less severely autistic and, as a result, that they should avoid ABA.

So, all this is to say that, despite its glaring weaknesses, Anderson's study would be very welcome by the editors of *Autism* if they share the philosophy expressed by the National Autism Society. Unfortunately, the views of the NAS and others of the autism self-advocacy movement come at the expense of both truth and freedom.

The Death of Truth and Freedom

Studies such as Anderson's—and, yes, there are others—give an inaccurate picture of the most popular and evidence-based treatment for autism and, if generally accepted, would serve to restrict the freedom of parents, teachers, and therapists who would like to use ABA. All seven of Anderson's participants expressed the view that ABA was unethical, and four of them said that "ABA should have no future at all" (Anderson 2022, 6). If these people had their way, the consequences would be devastating for thousands of children, adults, and families.

A final point: In my opinion, Anderson's article does not adequately appreciate the role of parents. ABA is not a monolithic program imposed by some government agency. The parent or guardian for each of Anderson's seven participants consented to an educational plan for their child that included ABA. Because special educational resources are often limited, it is quite possible that some of the parents had to fight to get ABA services. One of the participants, whose pseudonym was "Sarah," claimed ABA providers misled her parents, and another, "Sadie," said about her parents: "Part of me doesn't blame them because they did the best with the information they had at the time" (Anderson 2022, 10). But the upshot of this article reporting the opinions of seven highly verbal people is to damage the image of ABA and discourage its use despite it being, in the words of the CDC, one of the therapies with "the most evidence for treating symptoms of ASD."

It is one thing to form a social movement in an effort to gain greater acceptance of and better supports for a group of people in need. It is quite another to do so at the expense of another group who is also in great need. Helping people on the autism spectrum should not be a zero-sum game with gains at one end of the spectrum requiring losses at the other. Unfortunately, the autism self-advocacy movement's attacks on ABA create just such a dilemma. Groups that should have so much in common—people with milder forms of autism and the parents of people with more severe forms of autism—are now at loggerheads, and the apparent unity of the spectrum concept has been shattered. It is said that the first casualty of war is the truth, and in my opinion Anderson's article is an example of untruthfulness in this particular conflict. Should the autism self-advocacy movement—armed with disingenuous research such as this—make sufficient advances, the next casualty will be the freedom of parents of children with severe forms of autism to choose a therapy that the CDC says is among the most evidence-based available. That would be a tragedy that I hope we can avoid. ■

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[THE PRACTICAL SKEPTIC MICK WEST

Mick West is a writer, investigator, and debunker who enjoys looking into the evidence behind conspiracy theories and strange phenomena and then explaining what is actually going on. He runs the Metabunk forum, tweets @mickwest, and is the author of the book *Escaping the Rabbit Hole*.

UFOs over Kyiv

With the war in Ukraine taking up everyone's attention in that country, it can seem surprising that Ukrainians have the time and energy for other things. So it was rather unexpected when on August 23, 2022, a preprint of a paper on UFOs written by three scientists titled "Unidentified Aerial Phenomena I. Observations of Events" (Zhilyaev et al 2022) appeared in the arXiv database.

The three scientists are from the National Academy of Science of Ukraine, a respected and serious body established over 100 years ago. Led by Boris Zhilyaev, the paper they presented caused a significant stir both in the field of UFOlogy and within the academy itself.

The paper begins:

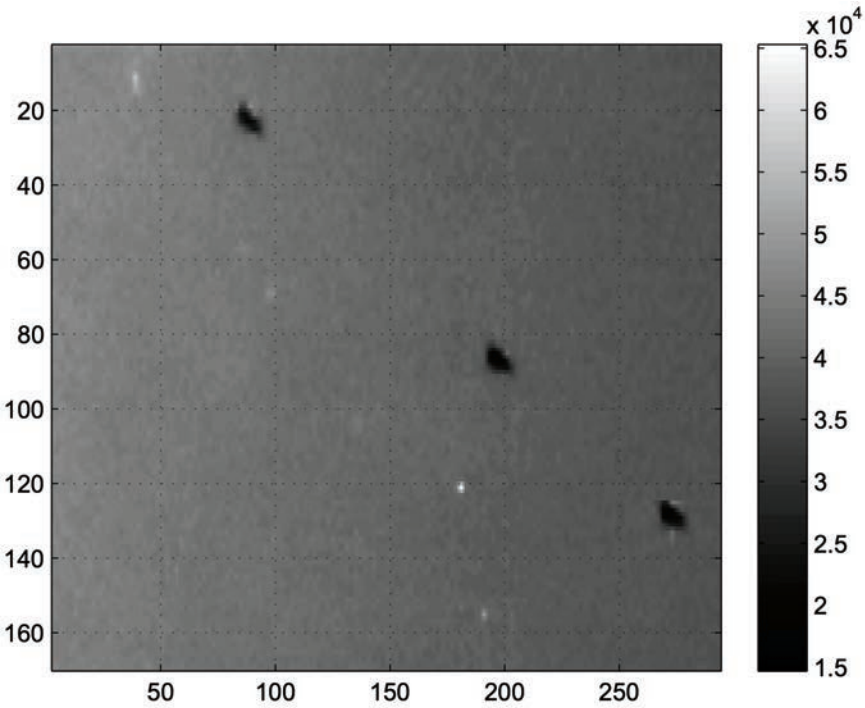
> NASA commissioned a research team to study Unidentified Aerial Phenomena (UAP), observations of events that cannot scientifically be identified as known natural phenomena. The Main Astronomical Observatory of NAS of Ukraine conducts an independent study of UAP also. … According to our data, there are two types of UAP, which we conventionally call: (1) Cosmics, and (2) Phantoms. We note that Cosmics are luminous objects, brighter than the background of the sky. Phantoms are dark objects, with contrast from several to about 50 per cent. We observe a significant number of objects whose nature is not clear. Flights of single, group and squadrons of the ships were detected, moving at speeds from 3 to 15 degrees per second. … Object contrast makes it possible to estimate the distance using colourimetric methods. Phantoms are observed in the troposphere at distances up to 10–12 km. We estimate their size from 3 to 12 meters and speeds up to 15 km/s.

These are extraordinary claims—astonishing if true—and my immediate thought was that the paper was a hoax, possibly a student prank. Surely real scientists would not be claiming to have detected fleets of UFOs over the skies of Ukraine. There was, as yet, no media attention, but people in the UFO community were starting to get excited. Was this the scientific proof of UFOs that they had long waited for?

Phantoms, Cosmics, and Swifts

I read the paper. It was surprisingly light on detail, but the scientists' basic story was that they had two cameras normally used for observations of meteors that had, in this case, occasionally captured other things that briefly traversed the frame. Sometimes dark (phantoms) and sometimes bright (cosmics and swifts), the objects seemed to be moving very fast, and the authors claimed that only the short exposure time (1/1000th of a second) and fast frame rate (50 Hz) allowed them to be seen.

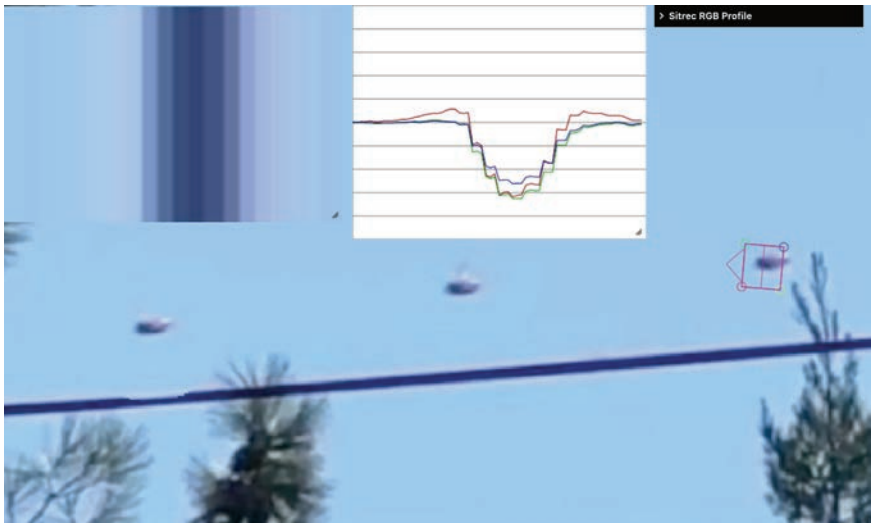
The authors described this as a "special observation technique," the first of many red flags. Far from being "special," those numbers are basically the default settings for tens of millions of cameras in daylight. Any time an iPhone shoots a video in sunlight, it's going to be using an exposure time of between 1/500th and 1/4000th of a second and a frame rate of 30–60 Hz (25–50 in some regions).



A composite image of three frames presented as a UFO but resembling an insect close to the camera

So what was so special? Perhaps powerful magnification? No, they showed some cropped images that included the daytime moon, and again they were little different from what you might get with an iPhone. So it brings up the obvious question: If the Ukrainians were doing nothing special, then why didn't everyone see these UFOs?

The answer, I quickly deduced, was that perhaps they did.



Applying the same "colorimetry" RGB analysis to a known fly gives a similar contrast curve suggesting a distant object, but the fly is just feet away.

If It Looks Like a Fly …

One of the images in the paper looked familiar. It was a composite image of three frames showing three dark shapes traversing what looked like a cropped portion of the image. The shapes were mostly black or dark grey with a few lighter pixels on the sides. The lighting and shape varied from one to the next, and they were unevenly spaced.

In my experience, a good percentage of the skill used in successful UFO investigations is simple recognition. Here I recognized them as something I'd seen many times myself: flies.

Hundreds of UFO videos show a small dark object shooting across the frame. The person taking the video often assumes this is far away, near the horizon, which would mean it was both big and fast. But comparison with other videos known to be of flies, just a few feet or even inches from the camera, shows that they look identical. Once you've seen it a few times, it becomes quite obvious.

Small or Far Away?

A constant problem in UFOlogy is determining if something is small or far away. In this case, the Ukrainians claimed to have solved the issue using what they described as "colorimetry." The authors describe this technique in only the vaguest of details, but it is basically using the fact that objects tend to blend in with the sky more as they get farther away.

The problem is that only works (and then only very roughly) if you know the color and reflectivity (the "albedo") of the object. The authors assumed the object was perfectly black and unreflective with a zero albedo. This is something that does not really occur in nature, so their distance estimates were entirely unreliable. I programmed a version of the tool they used to generate RGB profiles (graphs of the colors of the object relative to the sky) and found very similar results with nearby insects that had the same reduced contrast despite being only a few feet away.

Another thing that jumped out was the uneven spacing of the objects. They did not change their size in the image, so their distance did not seem to be changing, which meant it was speeding up or slowing down. Doing the math using their distance estimates gave a physically impossible g-force of over 2,000 g, but at a "fly distance" of a foot so, it was a perfectly reasonable 4 g.

I wrote up my initial findings just a few days after the paper was published (West 2022). The UFO community's reaction was not unexpected. I was accused of being insulting to the real scientists and insensitive to their stressful situation. Some people agreed with me, but many preferred to side with the scientists.

Lack of media attention meant that not a lot happened. I emailed the authors for comment and requested their data but received no response. In September 2022, a story in *Vice* rekindled interest (Gault 2022), and the usual suspects in the tabloid media started to write stories about how amazing the photos were.

The Academy Responds

While I'd been looking into this, the National Academy of Sciences of Ukraine had not been inactive. Concerned about the international attention the paper had been getting, they organized a presentation by the main author, Boris Zhilyaev, to give him a chance to explain himself. He failed to do this, giving what amounted to a rambling version of the paper with no additional information.

With no good answers, NAS of Ukraine had two of their top scientists review the paper. The academy eventually concluded:

> The article is pseudo-scientific in form and content, the methods are simply full of inaccuracies, simplifications, fabrications and outright manipulations. The conclusions are mostly absurd, far-fetched and have nothing to do with simple natural explanations of observed phenomena. Considering that the authors quite knowingly passed off this work as an already printed article in a professional peer-reviewed journal, I consider it a deception and falsification that casts the shadow of pseudoscience on the entire GAO. (Veles 2022)

Professor Loeb

A few days after that, there was another

response from a scientist. This one came from Avi Loeb, the director of the Galileo Project. Loeb produced a short paper in which he raised the point that at the speeds that they were estimating (15 km/s), the "phantom" objects would essentially *be* meteorites and burn up accordingly:

> I concluded that the reported speeds and sizes of the "phantom" objects would have generated fireballs of detectable optical luminosity at their suggested distances, and so these objects could not have appeared dark. However, if the phantom objects are ten times closer than suggested, then their angular motion on the sky corresponds to a physical velocity that is ten times smaller, 1.5 kilometers per second and their inferred transverse size would be 0.3–1.2 meters, both characteristic of artillery shells. (Loeb 2022)

This double blow was a disappointment to the UFO community, especially coming from Loeb, since he's been very open to the possibility that some UFOs are extraterrestrials.

It was a mixed bag from my perspective. On the one hand, Loeb agreed that the authors' distance calculations were off. But on the other, he suggested artillery shells were more plausible, making

My immediate thought was that the paper was a hoax, possibly a student prank.

no reference to insects. I wrote to him, pointing out the uneven spacing. He replied saying that was probably because the shell was coming toward (or away from) the camera. I pointed out the size did not change, and he dismissed that as being blurring or atmospheric distortion. I pointed out the closer image looked *smaller* when it should actually be 30 percent bigger. He was unconvinced, insisting it must be a shell about 1 km away moving at 500 m/s.

I investigated more, creating an interactive geometric calculator that demonstrates that the minimum speed would be well over ten times that value. I respectfully asked him to consider the insect hypothesis. Unfortunately, Loeb seems stuck on the artillery shell.

Uncertain Demarcation

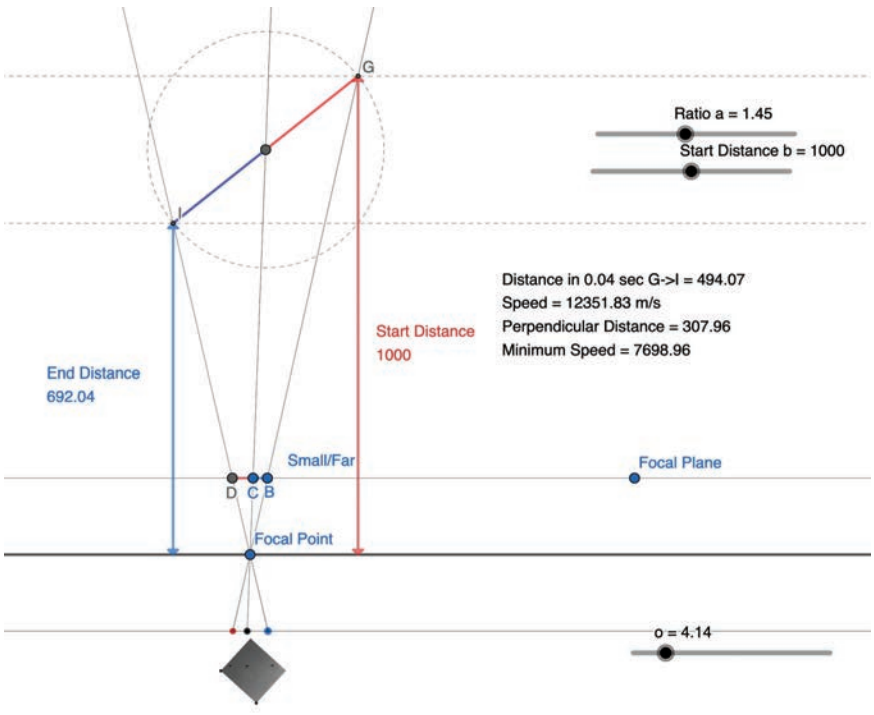
UFO research sometimes hovers near the borders of pseudoscience and sometimes is deep within that territory. This raises issues of scientific demarcation. How do we know if research is rigorously grounded in scientific principles or is more like hopeful pseudoscience?

Normally, if you were presented with an online article that stated the authors had observed "squadrons of ships" flying at impossible speeds in the air, then you'd assume it was pseudoscience. But then you see the paper was written by who seem to be three respected scientists from a legitimate institution. The content is the same, but people give it far more credence.

Then along I come, an uncredentialed skeptic. I correctly point out flaws in the study, but because I lack a PhD, it's very easy to choose to ignore me.

Even when PhDs and the voice of an entire academy refute the paper, there's still now an unfortunate perception that pro-UFO PhDs are equally likely to be correct. This is the problem of "false balance."

To address this, we must move past simply comparing how many PhDs one "side" of the argument has and instead find ways of presenting the analysis of the evidence in a way that is more accessible to everyone so they might more accurately see the reality of the situation. ■



The interactive calculator created by the author to demonstrate the minimum speed of the "phantoms"

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[SKEPTICAL INQUIREE BENJAMIN RADFORD

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Deconstructing the Dover Demon

Q: **What do you make of the Dover Demon? I haven't seen much skeptical analysis of that famous case.**

—C. Blennerhassett

A: The Dover Demon is one of only a handful of distinctly American monsters. It's also nearly unique in that—unlike, for example, the chupacabra or Bigfoot—sightings happened not over years (or decades) but instead over a little more than twenty-four hours.

The case, "one of the most baffling creature episodes ever reported" (quoted in Coleman 1983) is complex but can be fairly summarized as follows: On April 21 and 22, 1977, in Dover, Massachusetts, several teenagers over the course of three seemingly independent sightings reported the same unidentifiable creature. Dover, a small rural community of pastures and forest, is about fifteen miles southwest of Boston. The creature was first seen at about 10:30 at night by seventeen-year-old Bill Bartlett, who was driving along a road with two friends. As his car's headlights illuminated a wall, Bartlett claims to have seen a strange creature climbing on crumbling stones. He described it as having a huge melon-shaped head, spindly arms and legs, and a featureless face except for glowing orange eyes. He claimed the creature, about three to four feet tall, stared at his car as it passed.

He said he didn't mention it because his friends were in conversation, and neither of the passengers noticed it. However, after a while he did mention the otherworldly monster he'd seen. His friends wanted to return to see it as well, but he at first refused and then only begrudgingly agreed to do so. The delay in returning apparently allowed enough time for the creature to leave the scene, and sure enough there was no trace of it. Bartlett later drew a picture of what he saw (see Figure 1).

About a mile away and two hours later, another teenager in the same small town saw something odd—presumably the same creature Bartlett sighted. John Baxter, fifteen, was walking home alone near the woods and was surprised to see a bizarre creature only about fifteen feet away. It was standing bipedally near a tree and described as looking like a monkey or small child with a giant head and thin limbs. He, too, later made a sketch (see Figure 2). The creature was sighted again the following night when near midnight fifteen-year-old Abby Brabham said that she, too, had seen the same giant-headed, German shepherd–sized creature posing upright next to a tree—though she described the eyes

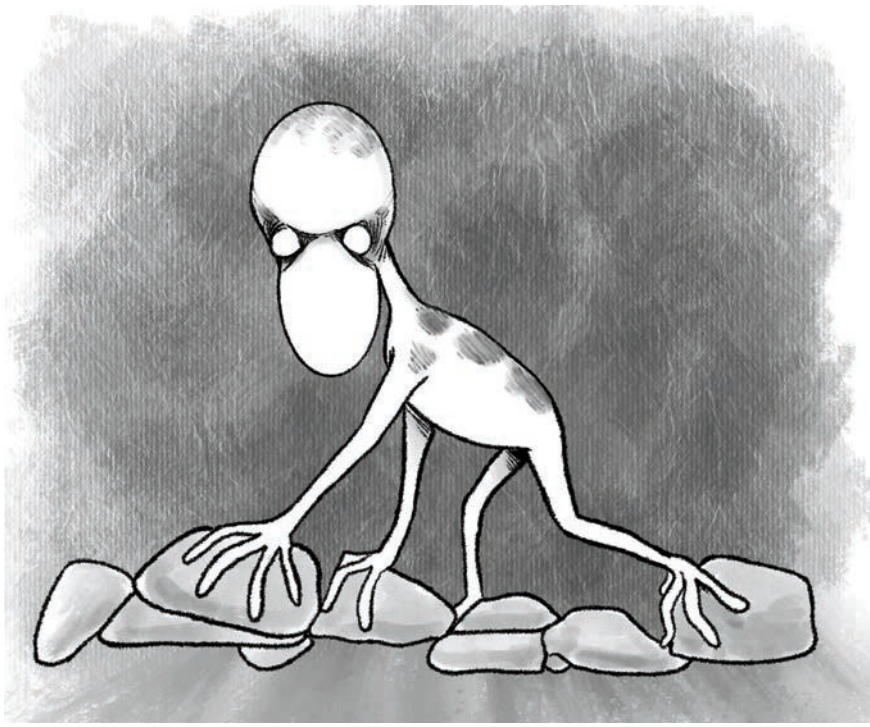

Figure 1. Illustration based on Bill Bartlett's sighting of the Dover Demon. Illustration by Celestia Ward.

as glowing green instead of orange (her friend Will caught a scant glimpse as well).

Veteran writer Loren Coleman coined the creature's name, did original research soon after the sightings, and described it in several of his books, including *Mysterious America* (1983) and *Monsters of Massachusetts* (2013).

Eyewitnesses but No Evidence

Various theories were offered to explain the sightings, and the conclusions—none of them particularly satisfying—tended to depend on which details were emphasized. Many suggested, based on the known fauna and the season, that it could have been a foal or baby moose, though a year-old animal would have been bigger and have antlers and fur. Others suggested a diseased fox or a homeless person. A cryptozoology conspiracy canard (which also appears in chupacabra lore) suggested that it was an experimental or genetically modified animal that escaped from some top-secret government laboratory. Still others suggested it might be a merman or water spirit of some sort (apparently due to its proximity to nearby creeks), a fairy, or an extraterrestrial.

Rather than making the classic anomaly-hunting mistake of picking a favored explanation and working backward to seek supporting evidence, a more fruitful approach is to take a closer look at the figure's morphology. We must of course allow for vagaries in eyewitness reliability, though Barlett, the main eyewitness, is described by Coleman as an excellent artist with a photographic memory. Even a cursory glance at the eyewitness drawings reveal that—whatever they saw, if anything—we can be reasonably sure that the sightings and illustrations are fundamentally (and fatally) flawed. This is because what's depicted is literally anatomically impossible, defying not only physiology but also the laws of physics. Any real animal with a head that large ("fully the size of the rest of the body") and a neck that thin would not survive gravity; its neck and spine would snap like a twig (for that matter, the Dover Demon's spindly legs couldn't have supported its body weight).

Unless the head is a thin shell filled with helium—instead of brains, a skull, mouth, and myriad sensory organs—something's very wrong here, and we cannot accept the sightings (or the drawings derived from them) as accurate.[1] The plausibility of the fantastical morphology described by the witnesses is further undermined by the facial features—both extant and absent. Despite being specifically (and perhaps cinematically) described as facing the eyewitnesses, no ears, nose, or mouth was reported at all. All animal heads contain sensory organs, yet this creature apparently only had eyes. And once again, the eyewitness descriptions hurt, not helped, their credibility; the detail of the glowing eyes cannot be correct, which I also reported in my investigation into Mothman's eyeshine (see Radford 2020).

As his car's headlights illuminated a wall, Bartlett claims to have seen a strange creature climbing on crumbling stones.

Explanations

This casts a new light on the events and allows us to narrow down the possibilities applying the skeptical principle of Occam's razor. The three basic explanations are: 1) the teenagers saw some living creature that literally could not exist, has never been seen before or since in forty-five years, and left no trace at all; 2) their descriptions (of whatever it was, whether mundane or monstrous) are hopelessly inaccurate; or 3) it's a prank pulled by—or on—bored teenagers on school break in a small town, which ended up creating a famous mystery.

The first explanation, though favored by mystery mongers, is unlikely in the extreme and has no evidence supporting it whatsoever. Anything is of course *possible*, but the burden of proof is on the claimant, and the question is instead what is probable given the evidence and circumstances.

The second explanation holds weight and has voluminous psychological research to back it up. We know that eyewitness testimony can be notoriously unreliable, *especially* under the conditions under which the Dover Demon was sighted: very briefly and in darkness. This theory leaves the door open for a genuine sighting of a real (though unidentified) local animal. It's certainly true that their descriptions don't match a young moose or deer—in fact they don't match *anything*! In other words, if they are sure they saw an animal (yet their descriptions don't match any animal), then either they were wrong about it being an animal or they were wrong about what they saw; it can't be both. Maybe what they saw wasn't an anatomically impossible head but instead a rack of light moose antlers glimpsed from an odd angle. We don't know what they saw—and neither do they. The implausibility of the eyewitness descriptions is not an argument in favor of their accuracy, and the influence of confirmation bias and psychological priming can't be ruled out.

The third explanation, that one or more of the teens either pulled a hoax or were themselves hoaxed, is about equally likely.[2] Teens in small towns routinely get into all sorts of minor mischief (I certainly did), and it's certainly a possibility. The fact that two of the main sightings occurred near walls or trees, which offer a place for someone to hide (or a place to hide support structures such as wires or sticks) may be significant. The edge of a forest along a road—instead of, for example, in an open field or downtown—would be an ideal place to carry out a successful hoax. Police who investigated the reports chalked it up to "nothing more than a school vacation hoax" (Associated Press 1977), and though many locals vouched for the teens' credibility, several pointedly did not.

Media Influences

There may also be a pop culture influ-

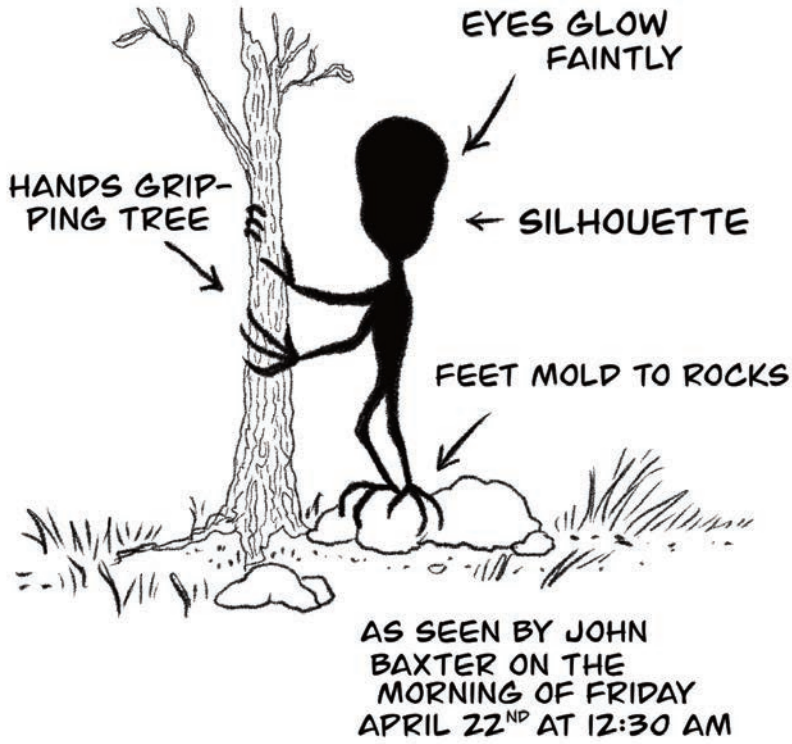
EYES GLOW FAINTLY
HANDS GRIPPING TREE
← SILHOUETTE
FEET MOLD TO ROCKS
AS SEEN BY JOHN BAXTER ON THE MORNING OF FRIDAY APRIL 22ND AT 12:30 AM

Figure 2. Illustration based on John Baxter's sighting of the Dover Demon. Illustration by Celestia Ward.

ence at work because 1977 was a seminal year for big-headed alien-type creatures. The most influential by far was the blockbuster *Star Wars*, which premiered several months before the sighting (and included realistic big-headed aliens, including in the famous Mos Eisley Cantina scene). This is not to say that the teens (at least one of whom was an avid science fiction fan) were necessarily consciously inspired by the film, but it's clear that film, television, and other media depictions have influenced cryptozoology eyewitnesses in other cases (see, for example, Loxton and Prothero 2015 and Radford 2011). Though big-headed aliens didn't become the "typical" morphology until the 1990s (see, for example, Joe Nickell's Alien Timeline), they were reported as early as the 1970s—including in the 1975 Travis Walton *Fire in the Sky* abduction case. Other literary and cinematic inspirations may have come from *The Hobbit*, which features the somewhat similar (creeping, hairless, large-headed) Gollum.

For his part, decades later William Bartlett insisted that the sighting was genuine. In a 2006 interview, he said, "I have no idea what it was. I definitely know I saw something. … In a lot of ways it's kind of embarrassing to me. … It was definitely weird. I didn't make it up. Sometimes I wish I had." He noted that because his name is synonymous with the case, he still got asked about it thirty years later. "It's a thing that's been following me for years. Not the creature—the story. Sometimes I dread every Halloween getting calls about it" (Sullivan 2006).

The fact that there is not a shred of independent corroborating evidence greatly complicates matters. Despite police searches and the participation of four researchers from five different UFO and Fortean organizations, including Loren Coleman, no evidence was ever found. Eyewitnesses were interviewed, measurements were taken, and reenactments were done (yielding some useful investigative information in some cases, such as that while one eyewitness "thought she had viewed the creature for as long as thirty to forty seconds, a timed reenactment placed the length of Abby's observation at only about five seconds"; quoted in Coleman 1983, 50). The fact that the Dover Demon was a one-off sighting reported by three teen friends in just over one day hurts its credibility as well. No one else in the town reported seeing anything strange, and nearby animals were reported to be acting normally.

In the end, the case rests entirely on three or four eyewitnesses. Absent a confession, there's unlikely to be a definitive explanation for the Dover Demon. However, skeptical inquiry points us to two equally likely—and ultimately wholly explicable—conclusions. ■

Notes

1. Of course, those who posit supernatural explanations for anything, including cryptozoological mysteries, are making an unfalsifiable claim. The second you claim that Bigfoot or Mothman, for example, is some supernatural interdimensional being that's not subjected to the laws of physics, then all bets are off and they may in fact be angels, fairies, or anything else we wish to imagine. Loren Coleman, for his part, accepts "the reality of Bartlett's sighting as an actual, unknown encounter [that] seems like a real, biological event" (Coleman 2013, 19) and not, for example, a supernatural or paranormal phenomenon.

2. It is perhaps significant that all the sightings were essentially by one person each time; in no case did two people claim to see the same thing concurrently. This raises the possibility that one (or both) of the later sightings were copycat hoaxes. Despite claims the teens were unaware of each other's reports (seemingly unlikely given the dramatic claims and the small town context), others may have heard about Bartlett's report and decided to fabricate their own solo sighting to join the attention and fun with a sighting that could not be challenged by anyone else. If that's the case, then the seemingly corroborative consistency between the three is a red herring.

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The grave marker of George Elwood Sharp (photo by the author)

The Case of the Devil's Baby of Ravenswood

The facts surrounding a folkloric Appalachian legend of a mysteriously glowing grave marker are "brought to light."

DANIEL A. REED

In Jackson County, West Virginia, near the eastern banks of the Ohio River, lies the quintessential Appalachian city of Ravenswood, population 3,865 (U.S. Census Bureau 2019). In many ways, this town is comparable with any number of places you will find in the state; it has restaurants, schools, shops, and municipal buildings, as well as various residential areas for houses both big and small. Indeed, very little sets this hamlet apart from any other, including the large and well-kept cemetery that is located near the edge of the town adjacent to a beautiful water feature known as Turkey Run Lake. It is here that our investigation begins, for it is here where the nascent legend of the Devil's Baby of Ravenswood was born.

In this solemn country cemetery lies a gravestone that has given rise to a most remarkable story. If you visit this graveyard and quickly glance at the headstone in question, you may not notice anything amiss. From a distance, when you look at the marker of the young George Elwood Sharp, you will notice that a memorial ceramic photo plate is affixed to it—just like so many other markers in this cemetery. However, as you approach this memorial, and upon closer inspection, you will find that the ceramic photo plate on this particular marker is quite different from the rest. Those given to sensational and imaginative paranormal predilections will be quick to point out that the image is of a demonical baby, complete with hollow eyes, fangs, and horns. What's more, the claim is that at night the ceramic picture plate on this tombstone emits an eerie, iridescent glow. Not only that, but if you listen carefully, you may be able to hear the child's disembodied cry drifting through the air across the cemetery lawn (Harley 2016; Cochran 2014; TheresaHPIR 2014; Urban 2016, 119–121).

Or so the stories go …

For the paranormal investigator, this case purports to provide plenty of evidence of supernatural activity. In examining this case we have claims that: 1) there is an image of a demonical child on a tombstone; 2) the image on the tombstone has an unearthly glow visible at night; and 3) the disembodied cry of a child can be heard in and around the cemetery at night.

Let us look at the various elements of this case and try to suss out any truth of the claims as well as examine some of the possible explanations. First, what of the grave itself? Does it even exist?

As is the case with several tales of the paranormal, there are some elements of truth to this story. In fact, there is a graveyard in Ravenswood, West Virginia, that does house the grave marker of George Elwood Sharp (see photo on p. 34), who was born in 1915 and died at the age of two in 1917.

But does the porcelain portrait plate really depict a child with physical attributes characteristic of a demon or devil?

True to the story, the headstone does have a ceramic or porcelain portrait plate affixed to it, and with a little imagination the picture could appear outré. But the explanation for the image is far more prosaic than supernatural. A cursory examination of the image on the ceramic plate reveals that it obviously has deteriorated over the years, and what remains has given rise to the legend. When you look at the picture

A close up of the ceramic picture plate of George Elwood Sharp's grave marker. Note the crack that traverses the plate horizontally and cuts across the area of the child's mouth (photo by the author).

on the plate—specifically when the lighting hits it at just the right angle—the faded remnants of the picture on the plate gives what is left of the child's likeness a devilish appearance with what can loosely be inferred as horns, and you can note what one website refers to as the "eerie white void of the eyes" (TheresaHPIR 2014). Further, a crack traverses the entirety of the plate horizontally, and it rather unfortunately cuts directly across the area of the child's mouth. The jagged edges of the crack produce the effect that the child has vampiric fangs.

Most websites that relay the tale of the Devil's Baby acknowledge that the child's portrait appears devilish or vampiric because of discoloration and fading due to weathering (TheresaHPIR 2014; Cochran 2014). None, however, acknowledge the presence of the crack in the plate that gives the illusion of fangs. From a psychological perspective, the attribution of the horns and fangs in this photo are consistent with the phenomenon of pareidolia, which Merriam-Webster defines as the "tendency to perceive a specific, often meaningful, image in a random or ambiguous visual pattern."

Truly, with respect to the way the image appears, the only surprising part of this entire story is that the image is still visible at all. In his work *Forgotten Faces: A Window into Our Immigrant Past*, Ronald Horne examines the historicity of pictorial grave markers and acknowledges their ephemeral nature: "Unfortunately, after many decades some photographs vanish completely" (Horne 2004, 24). A combination of exposure to the sun and weather, the method by which the image was created and transferred to the ceramic/porcelain plate, and the composition and quality of the pigmentation used to create

the picture all coalesced to produce a deteriorating image that is slowly dissolving with the passage of time. While the imagery that remains is interesting, it is not inexplicable or even particularly mysterious by itself.

With a little imagination the picture could appear outré. But the explanation for the image is far more prosaic than supernatural.

However, what of the claim that the ceramic plate emits an unearthly glow at night? To better understand the image, let us first examine a bit of the history of how such pieces of that time were made. In his work on ceramic/porcelain grave markers, Horne examines the historicity of the memorials: "French photographers Bulot and Cattin were successful in fixing a photographic image to a porcelain enamel," a process they patented in 1854 (Horne 2004). As the years progressed, the methods for this process were refined, and while the "exact chemical combinations varied," photographers used "chlorides or nitrates of gold, silver, platinum, and its elemental cousins, palladium and iridium" (Horne 2004, 63). In fact, the process for making these images and imbedding them on the ceramics "varied significantly," and the "precise recipes were guarded by their creators" (Horne 2004, 64).

Given this, is it theoretically possible that some of these proprietary recipes could have involved radioactive materials, such as radium or tritium, that could cause their finished product to fluoresce in the dark? Even the Environmental Protection Agency (EPA) has a website dedicated to information on the presence of radioactivity in antiques and specifically speaks to radioactivity in ceramics. The EPA's website states that "Ceramics made until the 1970s may have glazes colored with radionuclides" and that "Radioactive antiques can continue to emit very low-levels of radiation for thousands of years, if not longer" (U.S. EPA 2022). What's more, the amounts of radiation that are emitted are sufficient such that they "can register on a hand-held Geiger counter if the object is close enough to the monitor" (U.S. EPA 2022). So the question becomes: Is it possible that the ceramic picture plate has a low-level radioactive signature that may account for the alleged unearthly glow?

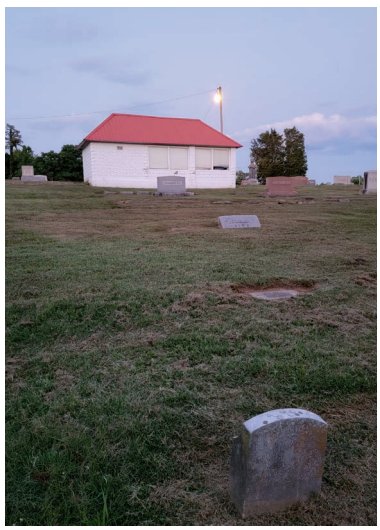
Put succinctly, in this particular case, the answer is "no." Radioactivity has nothing to do with the "glowing" picture plate—not in the least. I used a few devices to examine the potential causes of the alleged glow. First, I used a Geiger counter to determine if any radioactive substance was present in the picture plate that might possibly account for a nightly glow. When placed near the ceramic/porcelain plate, the readings were no different than they were anywhere else in the cemetery (around twenty-three counts per minute [CPM]), which according to the United States Nuclear Regulatory Commission is well within the normal range for background radiation levels (United States Nuclear Regulatory Commission 2020).

Thus, with the unremarkable findings related to radioactivity, I tested the hypothesis that the plate contained some other material that fluoresced in the dark and caused the plate to glow. To that end, because it was still during daylight hours I used a light-blocking blanket along with a device that I contrived to block out any vestiges of light. I placed the blanket over the tombstone and crawled underneath it (all the while noting that no glow seemed to be visible in this low-light condition) and placed my light-blocking device over the porcelain picture plate.[1] As I peered through the makeshift device's eyepiece, no glow issued forth from the picture plate; in fact, it was so dark inside the device that I could not see anything at all. Had any light issued forth from the picture plate, it would have been easily observable under these conditions.

So if the plate is neither radioactive nor fluorescent, what is the explanation of the alleged unearthly glow that is reported by various websites (TheresaHPIR 2014; Cochran 2014)? Once the sun started to set in the western horizon and dusk settled in upon us, the explanation for the unearthly "glow" became obvious.

As noted, the image on the porcelain/ceramic plate is quite deteriorated, leaving significantly lighter (even white) areas of the ceramic exposed. The "glow" that people attest to having seen appears to be nothing more than light reflected off the relatively white surface of the ceramic plate. An electric security light lies approximately 100 feet away from the grave, and its light shines directly upon the plate. (See points "A" and "B" on the map on p. 37.) The "glow" becomes visible when the sun begins to go down and the dusk-to-dawn security light comes on to illuminate the area. (See photos below.)

So, what of the third and final mystery associated with this case—the claim that there is disembodied crying that



The cemetery office with security dusk-to-dawn light on. The grave in the forefront of the photo is the grave of George Elwood Sharp. The distance from the grave to the light is approximately 100 feet (photo by the author).

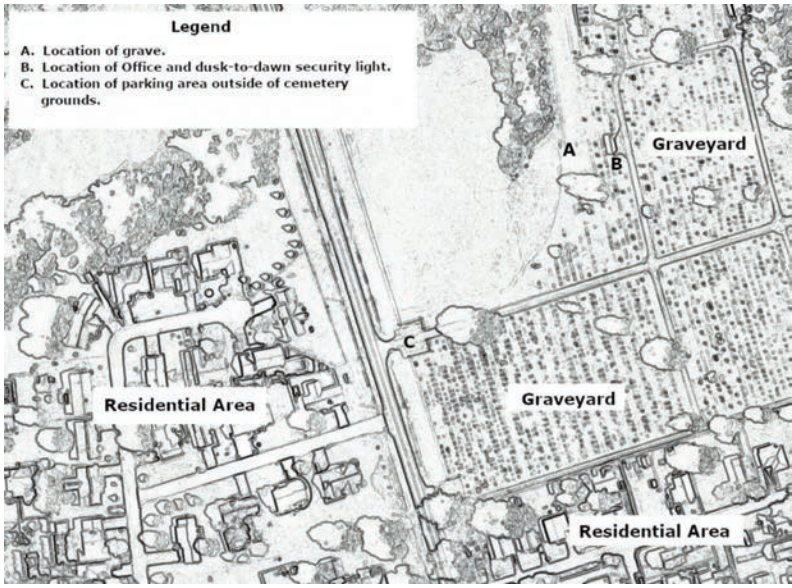
George Elwood Sharp's tombstone at dusk. Note how bright the picture plate is relative to the rest of the area around the stone due to the reflected light from the security lamp. This effect becomes more prominent as darkness waxes (photo by the author).

can be heard at night in the graveyard? Given the location of the cemetery, it becomes easy to understand how one might hear a crying infant there. As a matter of fact, one can hear a variety of sounds while at the grave in question, including muted conversations, dogs barking, television sets blaring, wind blowing through the nearby trees, and any number of other ambient sounds. This cemetery is located in a relatively flat field, and the graveyard is basically bordered by residential areas. (See map indicating the location of the grave of George Elwood Sharp in relation to the residential areas nearby.)

As darkness fell upon the cemetery and before the access gates were closed for the night (West Virginia code states that being present in a graveyard beyond "reasonable hours" is a violation of the law and individuals found on the premises are trespassing), the investigation moved to the parking area just outside of the cemetery grounds (noted as area "C" on the map) but still well within sight of the grave in question. While at the grave, as well as while heading back to the parking area, I noted various sounds emanating from the residential areas, and those sounds carried quite clearly across the field. While the cry of a child was not specifically noted, it is not inconceivable (and certainly not unreasonable to suspect) that had a child in any one of the nearby residences been crying, one would be able to hear it from within the cemetery. This would especially be the case if a window of the residence were open or someone had the child outside. Psychological priming and confirmation bias—that is, people specifically listening for anything that might sound like a crying child—could likely also play a role for ghost hunters and investigators familiar with the story.

And so, satisfied with my findings, I elected to close the investigation. I left the scene secure in the knowledge that no paranormal explanation was needed to understand the alleged phenomena. While it may be entertaining to tell spooky stories and create myths and legends, it is incumbent upon us to remember the humanity behind cases such as this. This grave marker belongs to a child who was once living and breathing. Because of the relatively fleeting nature of existence, the memorial that was put in place to celebrate his life has eroded and has unfortunately become distorted. From this distortion, an urban legend has arisen, and through the spread of misinformation, falsehoods, and the mystery mongering of the "woo" culture in which we live, the facts surrounding the case of George Elwood Sharp are lost. In its wake, we are left with a fabricated myth that depicts an innocent child as a possible monstrosity. This is the true horror of this case.

I hope that this article places the facts of this matter on record and this information is as easily obtainable (if not more so) than the misinformation that is so readily available about the case on the internet. Hopefully, we can put to rest the myth that little George Elwood Sharp was some type of monster or demon, and this research will help dispel the falsehoods and misinformation surrounding him and his memorial. ■



Ravenswood and Environs (map rendering by the author).

Note

1. The "device" was an opaque duct-taped plastic bottle, which had the bottom removed so that the bottle could be placed directly up against the tombstone, surrounding the ceramic plate in its entirety. This occluded any remaining outside light that might possibly interfere with my observations. The bottomless bottle had the cap removed, and the open neck of the bottle served as the "eyepiece" of the device through which the plate could be observed in extreme darkness.

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The James Webb Space Telescope: First Responses from Religion

The first photos from the James Webb Space Telescope have provided insight into early star and planet formation regions and are of unprecedented clarity and beauty. They have also prompted reactions by Christian communities published by various media outlets. An initial survey indicates a wide range of viewpoints, which variously could be categorized as compassionate, contrary, or coactive.

MANFRED CUNTZ

There is a long and intricate history of the relationship between science and religion. An early and well-studied example includes Galilei Galileo's trouble with the Roman Catholic Church when he was put on trial because of his advocacy of his heliocentric idea and his conflict with Pope Urban VII (see, e.g., Hellman 1998). Many of the more recent discourses on the interface between science and religion are related to the teaching of evolution, one of the cornerstones of contemporaneous science (see, e.g., Alters and Alters 2001; Bleckmann 2006; National Academy of Sciences and the Institute of Medicine 2008). In the meantime, significant advances have been made in astronomy and astrophysics, providing detailed and unequivocal evidence that the Big Bang happened about 13.8 billion years ago. Supportive results include the discovery of the cosmic microwave background in 1964, among other findings (Partridge 1995). Previous articles in the Skeptical Inquirer provide additional food for thought about modern-day cosmology as well as why Earth can't be 6,000 years old (see Collins 2021).

A new chapter of scientific discovery will be opened through observations by the James Webb Space Telescope (JWST)[1] devoted to the study of large-scale cosmological structure, star-formation regions, and individual celestial objects. Besides the acquisition of new results in astronomy and cosmology, it will also be of great interest to examine related societal aspects associated with those findings, including how they impact philosophy and the reactions from religious groups and individuals. In this article, I'm summarizing some current views voiced by some Christian communities presented by various media outlets. In fact, there is a very wide range of responses, encompassing praise, admiration, curiosity, and ignorance, as well as denial.

The James Webb Space Telescope

The JWST, which was launched on December 25, 2021, from the Guiana Space Center in Kouron, French Guiana, is a space telescope chiefly designed to conduct infrared astronomy.[2] It is currently the largest optical telescope in space; its

high infrared resolution and sensitivity allow it to view objects too early, distant, or faint for the still-operating Hubble Space Telescope. Observing in the infrared spectrum is a key technique in that regard, both because of the cosmological redshift associated with super-distant objects and because infrared light better penetrates obscuring dust and gas, thus allowing observation of dimmer, cooler objects. Therefore, the JWST is expected to make fundamental contributions to the fields of astronomy, cosmology, and astrobiology. Because light takes time to travel, the JWST will allow us to look back into the past, a feature of great value. The JWST will allow observations of the first stars as well as the formation of the first galaxies and the structures in existence relatively soon after the Big Bang. Furthermore, the JWST will permit the detailed atmospheric characterization of potentially habitable exoplanets, a key aspect in the search for life beyond the Solar System.

The Compassionate Approach

There are a significant number of articles that to a great degree offer praise to the initial findings from the JWST (see, e.g., Cox 2022; Dallas 2022; Israel 2022). They rightfully point out that we're entering the golden age of space exploration and commend the work by NASA. Some of these articles are looking forward to the emerging discourse between science and religion and show interest in new questions pertaining to religious teachings. Ongoing research about the origin of life on Earth is mentioned as well—so is that the JWST is expected to shed light on finding alien life on other worlds. Finally, the emerging prospect of civilian space travel is pointed out—including activities by commercial space companies such as Blue Origin, Space X, and Virgin Galactic.

Typically, these articles sidestep the question of whether or not the Big Bang actually occurred or, alternatively, emphasize the common ground between science and religion. For example, one article mentioned that in 2015, NASA provided a grant to the Center of Theological Inquiry to bring together theologians and scholars in humanities and sciences to discuss topics of joint interest, including pondering over the implications of finding life beyond Earth (Cox 2022). There is also recognition that based on the images by the JWST creation is still ongoing (Israel 2022).

The Contrary Approach

There is a notable segment within the Christian community that chooses to champion young-earth creationism (YEC); this approach follows the notion that the Earth and the universe are about 6,000 years old and that the Big Bang never happened. Observations by the JWST will again fundamentally challenge this kind of worldview, as has been done by previous results of astronomy, astrophysics, and cosmology. Generally, YEC is fundamentally opposed to many findings of natural science.

When the first pictures of the JWST were published, the reactions by followers of YEC—as disseminated by, e.g., Answers in Genesis—was in essence ignorance, as it was pointed out (not unsurprisingly) that the Bible records the correct history of the universe and mankind. The article in question lists various previous findings obtained by Earth science and astrophysics while confronting those results with the biblical account in accordance to their interpretation. Moreover, Ken Ham of Answers in Genesis argued that "the big bang is nothing more than fallible man's attempt to explain the universe without God so that we aren't accountable to God" (Ham 2022).

Clearly, basic findings of modern-day astronomy are at odds with the basic tenets of YEC. Both approaches are usually mutually exclusive. One possible approach includes disputing the finite value for the speed of light, which was determined by Ole Rømer in 1676 based on the eclipse timing of Jupiter's moons (e.g., Comins 2019), although his number has subsequently been updated based on additional research. In addition, Ham also laments that "it's sad that many Christian leaders have attempted to compromise man's atheistic religion with God's clear Word in Genesis" (Ham 2022).

Quote Mining

According to Wikipedia, quote mining (sometimes also referred to as "quoting out of context" or contextomy) is considered "an informal fallacy in which a passage is removed from its surrounding matter in such a way as to distort its intended meaning." Based on the same source, quote mining may be either intentional or accidental, such as when someone misunderstands the meaning and mistakenly omits something essential to clarifying it.

A prime example of quote mining occurred in the Ken Ham article just discussed in reference to a scientific manuscript led by L. Ferreira (University of Nottingham, UK) published in *The Astrophysical Journal Letters* (ApJL), a flagship journal published by the American Astronomical Society. The manuscript is titled "Panic! At the Disks: First Rest-frame Optical Observations of Galaxy Structure at z > 3 with JWST in the SMACS 0723 Field." The topic of this study is that early observations by the JWST point to a relatively high number of spiral galaxies (akin to the Milky Way) compared to other types of galaxies, which according to the authors is unexpected and thus challenges existing galaxy formation theories (Ferreira et al. 2022). However, the recitation of this work as given by Ken Ham reads, in part, as follows:

> Why do the JWST's images inspire panic among cosmologists? And what theory's predictions are they contradicting? The papers don't actually say. The truth that these papers don't report is that the hypothesis that the JWST's images are blatantly and repeatedly contradicting is the Big Bang Hypothesis that the universe began 14 billion years ago in an incredibly hot, dense state and has been expanding ever since. Since that hypothesis has been defended for decades as unquestionable truth by the vast majority of cosmological theorists, the new data is causing these theorists to panic. (Ham 2022)

It is noteworthy to point out that there is no direct relationship between the work by L. Ferreira et al. and the Big Bang—except, of course, without the Big Bang, galaxy formation would not have happened in the first place. On the

other hand, arguably, the title chosen for this study is a bit lurid, and it is mildly surprising that it wasn't changed during the review process.

The Coactive Approach

There is also a great example of a coactive approach, exemplified by the work of Scott Acton and related articles (see, e.g., Friesen 2022; Huff 2022; Saylor 2022). Acton is a 1984 graduate of Abilene Christian University, located in north central Texas, which is associated with The Church of Christ. After completing his physics degree at West Texas University, Acton earned a doctorate at Texas Tech University in Lubbock. Thereafter, he chose to start a career in the aerospace industry. Acton's previous commitment to science also included an assignment at the Keck Observatory on the island of Hawaii, which helped spark his interest in astronomy.

Currently, Acton works as a scientist at Ball Aerospace & Technologies Corp. in Boulder, Colorado. In that role, he serves as the wavefront sensing and controls scientist on the James Webb Space Telescope project—what would turn out to be an almost twenty-four-year endeavor. Acton feels that regardless of a person's beliefs, viewing the images from the James Webb Space Telescope will be a spiritual experience. For him, the observations by the JWST—as currently available and expected in the future—are a reaffirmation of his faith. He recounts that some single JWST images are expected to contain several hundred galaxies. Taking the Milky Way as an example, each galaxy is expected to contain more than a billion stars, with most stars surrounded by stellar habitable zones, implying the possibility of extraterrestrial life (e.g., Bennett and Shostak 2017).

Conclusions

The launch of the James Webb Space Telescope on Christmas Day 2021 has certainly opened another window of new discoveries. According to NASA, this new instrument is superior to Hubble because it allows the study of more distant objects, which translates to objects that formed much sooner after the Big Bang. Hence, among other aims, the JWST is devoted to the study of the first galaxies formed in the universe. Other objectives include the study of star formation regions, analysis of protoplanetary systems, and insight into exoplanets at different stages, including planets in stellar habitable zones with the potential for life.

Clearly, the JWST will also touch the crossroads where science and religion meet. The richness of the JWST's envisioned discoveries, in consideration of its estimated lifespan of up to ten years, has the potential of adding to conversations and discourse in science methodology and philosophy. Current reactions by Christian communities include a wide range of viewpoints, encompassing praise, admiration, curiosity, and ignorance, as well as denial. It will be of great interest to take note of future developments in that regard, as well as possible responses of members who are part of other belief systems. ■

Note

1. See https://webb.nasa.gov/ for further information.

2. Technically, the pictures from the JWST as published are false color images, because human eyesight is insensitive in the infrared. The JWST-based infrared images are transferred to the visible regime while keeping the relative wavelength composition intact, thus preserving their overall information.

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Analysis of an Arthur Ford Séance

A séance by American medium Arthur Ford reveals extensive guessing and wrong descriptions of an accident, as documented by an official military report.

LOREN PANKRATZ

In 1929, Arthur Ford was credited with revealing the secret code that Harry Houdini said he would transfer to his wife if he survived death. After that, Ford was considered the greatest American medium of the twentieth century, and he attained extensive public recognition again in 1967 when he delivered a message from the deceased son of Bishop James Pike. One biographer averred that he was "subjected to every test a highly developed science of psychical research could devise and passed them all" (Ford and Ellison 1971, 162).

The focus of this article is a 1964 séance that Ford conducted with an Ohio couple who lost their only son in the explosion of a U.S. Air Force refueling tanker at Eielson Air Force Base near Fairbanks, Alaska. The séance was recorded and transcribed, as were many of Ford's séances, and Allen Spraggett devoted about four pages to the event in his biography of Ford (Spraggett 1973). The parents were so impressed with Ford's revelations that the father stated, "Our lives were changed from that time on." The father concluded his letter by saying, "There is no way that Arthur Ford could have obtained most of this material and it couldn't be mental telepathy because some of the things we did not know at the time of the sitting."

I obtained Ford's notebooks and files from his heir,[1] including the original twenty-page transcript of the séance that Spraggett used for his book, *Arthur Ford: The Man Who Talked with the Dead*. For further evaluation, I requested the official Air Force Investigation and Analysis of the fatal crash through the Freedom of Information Act. We can now compare the information that Spraggett provided with the words of Ford and facts of the event.

Arthur Ford (author's collection)

The Séance with Three Dots

In a typical séance, Ford reclined on a davenport or soft chair and entered a trance state. His spirit guide, Fletcher—a deceased boyhood friend of his—then took over. Ford described Fletcher as a "discarnate" who assisted other less experienced discarnates to communicate with seekers. Fletcher informed the parents that people who die do not go directly to heaven; they live with others who help them achieve their ultimate destination. At this point in the narrative, Spraggett entered three dots, an ellipse, which indicates that text has been excluded. Next, the reader sees that Fletcher relayed the son's love and greetings to his parents.

But what did Spraggett omit with those three dots? When the couple visited Ford, they told him nothing about who they wanted to contact during the séance. Thus, the first task of Ford was to determine the person of interest so that he (or Fletcher) could address the couple's grief. The original transcript shows that Fletcher claimed people were appearing before him but were obscured by a hazy aura, "a kind of magnetic field" that he would interpret.

> ***Fletcher***: There are several people. I am impressed mostly with a young person, you understand, who was very close to you.
>
> ***Parent***: Could you tell us more about this person?
>
> ***Fletcher***: I have to wait 'til I pick it up; I cannot force it. I can see, even now I can't see whether it is a boy or a girl, man or woman, but I see a great light coming which indicates I know how to interpret it. A great eagerness and a great love and rushing out, don't you see? And I have a feeling of some kind of a, I don't know what it is, how to interpret it. It's like a, that my body was hurt some way, you understand? It was a, suddenly I felt, the thought was thrown at me. I don't know where it comes from that, that whatever I am talking about is that something hit me or I hit something, you understand?
>
> ***Parent***: Can you get a little more information of how this person looks? What are they doing?
>
> ***Fletcher***: Was it an automobile accident, or what was it?
>
> ***Parent***: No, it wasn't an automobile accident.
>
> ***Fletcher***: I think this is a child yours, isn't it?
>
> ***Parent***: Yes, it is.

Fletcher: Well, it was a crush—my body was—it might have been surgery or something. I don't know.

Parent: No, it was an accident, it was an accident, and it was …

Fletcher: It might have been a train or car, something moving, I don't know what. An airplane.

Parent: An airplane, yes.

Spraggett returned to the transcript to show Fletcher reassuring the parents that their child did not suffer in the fatal event. Then he focused again on the nature of the accident, but the reader sees only a snippet of Fletcher's attempt to gather information.

Fletcher: He wasn't flying the thing, was he?

Parent: No.

Fletcher: He was only a passenger, wasn't he? There must have been four or five others.

Parent: Right.

Fletcher: There must have been quite a few other people in the thing, wasn't there? Four or five?

Parent: Seven on board with him.

Fletcher: Seven on board. Yes. I know it was not a great big passenger plane, you know what I mean … ?

Fletcher: It was a, it was a private plane, you understand. [no response]

Fletcher: Maybe it was a government plane, I don't know.

Parent: It was a government plane.

Fletcher: And a, if he'd had time, expected the thing, he could have jumped, you understand? But they weren't prepared to jump, did you know that?

Parent: That is probably very true.

But that was *not* true. The son was the food-service provider on a KC-135A air refueling craft that exploded one minute after taking off from Eielson Air Force Base near Fairbanks, Alaska. The plane was similar to a Boeing 707 airliner, which has no provisions for jumping or ejecting; moreover, the plane failed at an altitude too low for a parachute.

Fletcher: I want to go southwest with this. You know why I want to go southwest? This didn't happen near where you live, did it? [These questions get no responses.]

Fletcher: It was either, I don't know whether it was the Atlantic or Pacific Ocean. I see the ocean, know what I mean? I don't see it in war time though.

Parent: No, you are right.

Fletcher: It's just the, comparatively recent, maybe two or four years?

Parent: Not quite two years.

Fletcher: But, it was a, flying east. I am sure; east. See if I can make it out.

The father ignored this statement and asked about the accident. Fletcher again gave comforting statements and returned to the "east" issue.

Fletcher: Wasn't he stationed in the east somewhere?

Parent: No, not in the east.

Fletcher: Well, he was flying east when it happened.

Parent: He could have been flying east, or the take-off was to the east probably.

Fletcher: Because I see the ocean, I don't know if it was the Atlantic or Pacific.

Parent: That's Pacific.

Fletcher: This thing happened in the Northern part, Northwest.

Parent: Yes. That would be right.

Fletcher: I don't know whether it's in Northern California, or Oregon, or Washington, out that way. You know?

Parent: Do I know?

Fletcher: That's where it happened.

Parent: Well, actually, it happened in Alaska.

Fletcher: Oh! Well, I know it was in the Northwest, but that they were flying toward this country. They were on a training flight, see what I mean?

Parent: Umhm.

Fletcher: And it happened over the water, you know what I mean? And there wasn't time to jump but there was nothing to worry about. Now he reached out and a woman comes and she's your mother, sir, his Grandmother, I guess, couldn't it?

Parent: No there must be somebody else.

The only known photo of Ford's boyhood friend and spirit guide, Fletcher. (Author's collection)

Fletcher tried to introduce the parents to someone on the other side whose name started with and E, or it could be a C. Or maybe it was a B—because they all sound alike. Maybe her name was Lottie or "sounds like Lollie or Lockman or something." Then Fletcher became certain the name was Charlotte, but they called her Lottie. He asked about the cancer of Elizabeth, but the parents could not recall any Elizabeth, so Fletcher said it was Mary, not Elizabeth, who had the cancer. Again, the parents could not identify Mary. Fletcher asked about the mother losing a sister (no) or a brother (no). Then he returned to Elizabeth or the person whose name started with an E.

All this fishing—and much more—is omitted from the text. Instead, readers only see Fletcher's declaration that their son is happy and did not suffer in his death. The parents repeatedly asked what their son was doing, but Fletcher never answered that question. They said he was passionate about aviation, but Fletcher would have sounded absurd to say that

Ford received requests for séances from every state in the union. (Author's collection)

he was flying airplanes in heaven.

After all these fishing failures, Fletcher began offering names of people their son might have known on earth who were now with him on the other side. These startling successes included greetings from a deceased pastor in their hometown and a former school superintendent that the father later identified as someone he knew from his local Masonic Lodge. The parents were further surprised by the introduction of a Rev. Bean, who baptized their son, and Bean's wife. They did not know she had died but confirmed her death after returning home, hence the parents' declaration that Ford's success "couldn't be mental telepathy."

Massive Failure Framed as Success

Success is best judged after considering the larger context. For example, the transcript of a séance should always be compared with the original recording (Shuy 1996). I possess only the transcript of this séance but have no reason to believe that the document is unfaithful to the statements of Ford. On the other hand, Spraggett's summary clearly fails to convey the extent of guessing. Furthermore, many of Fletcher's statements about the accident seem initially plausible until they are compared with the official government investigation. Fletcher was almost always wrong, often wildly wrong, even when his declarations were expressed with bold confidence.

The crash at Eielson was about three hundred miles from the Gulf of Alaska, nowhere near water. Their son could not have flown the plane or made a parachute jump, as Fletcher stated, and the plane did not take off to the east or fly east. Fletcher was wrong in his description of the airplane, its location, its mission, and the nature of the accident. Fletcher said the son's body was not returned home, but that was not true. When the parents asked if their son had any messages for his friends, Fletcher gave some platitudes about life that reflected the belief of Ford, not statements expected from an adventurous youth.

Ford knew little about the family when he met them, and Fletcher did not know the name of their son who was purportedly standing in front of him. Sixteen pages into the twenty-page transcript, Fletcher finally had to ask the parents for their son's name, a dialog that Spraggett included in his summary. Fletcher had tried but failed to name some relatives, but he was able to identify a couple of deceased pastors from their hometown. Even if we give Fletcher credit for this success, these individuals were a side issue in the life and death of their son. The flight crew was conspicuously never mentioned.

We are left with the task of explaining how the parents ignored these massive failures and declared the séance a success. The answer must lie in Ford's style and skill in creating a belief that for a few brief minutes he was in contact with their only son. The experience can be compared to the difference between reading a play and sitting in the front row of live theater. They were overwhelmed (or distracted) by the reassurance that their son had not suffered and was now happy.

Hot and Cold Running Patter

Arthur Ford said that "mediums should be kept off our platforms until their work becomes evidential" (Ford 1937). Thus, he has given us permission to ask if he provided evidence that he was in contact with the other side, or if he role played and faked that ability. The amount of fishing in this transcript is typical of a common cold reader. Ford's direct hits on the names of those dead pastors suggests prior knowledge, and this is consistent with what we know about how Ford surreptitiously prepared for séances.

Ford kept an extensive file of death notices, especially of pastors and priests from across the nation (Rauscher 2006, 120). He collected this information by reading three or four newspapers in addition to magazines. The discovery of one specific clipping unraveled his most famous séance success. Rev. William Rauscher was sorting through Ford's personal papers when he found a clipping of the obituary of Bishop Karl Morgan Block (Rauscher and Spraggett 1975, 112). This article contained details that convinced Bishop Pike that Ford had divined information so obscure and idiosyncratic that it could only have come by revelation in the séance. In a final analysis, Spraggett was forced to admit that "data which once loomed large as evidence for paranormal processes have shriveled to virtually nothing" and that "the evidence is disquietingly strong that Ford cheated" (Spraggett 1973, 261). Similarly, Ford utilized knowledge available to him for his successful séance with Beatrice Houdini (Rauscher 2000). And, incidentally, Ford did not pass all the psychical research tests administrated by scientists (MacRobert 1954).

After attending Ford's demonstration of clairvoyance in London, Arthur Conan Doyle said it was "one of the most amazing things I have ever seen" (Ford 1958, 47). However, there was a darker side to Ford's life. A year after this praise, Doyle warned a friend that Ford was "astray into night life and unsavory adventures."[2] Indeed, Spraggett devoted a whole chapter to the social and moral failings of Ford. For example,

Ford claimed that he did not make his living as a medium because he had inherited Florida real estate, but that assertion was false (Editors of *Psychic Magazine* 1972, 22).

Some of Ford's difficulties were the result of an auto accident he suffered in December 1930. His sister and another passenger were killed, and Ford became addicted to morphine while hospitalized. Ford admitted that his suffering was followed by "about twenty years of alcoholism" (Ford 1958, 148). However, Ford was involved in binge drinking before the accident; he often drank excessively before séances, and he struggled with alcoholism to the end of his life. Even more, he consumed large quantities of nutritional supplements and pills.[3] Sadly, he was seldom free of health complaints, and he spent considerable time seeking medical care. At the end of his life, he endured over 212 electro-cardioversions for atrial fibrillation (Rauscher 2006, 175).

I have no reason to conclude that Arthur Ford's work demonstrated contact with departed spirits. Even his sympathetic biographer, Allen Spraggett, cited many examples of Ford cheating at séances, although sometimes he included less damning alternative explanations. I believe that Spraggett and the parents he described were overwhelmed by the charisma of Arthur Ford. Despite all the contrary evidence, Ford easily convinced people that he talked to the dead. ■

Notes

1. Rev. William Rauscher was a longtime friend of Ford who conducted his funeral.
2. Letter from Doyle to W.F.R. Fast, August. 17, 1928.
3. Ford also experimented with LSD, administered by Ian Stevenson, MD, as a way of investigating psychic phenomena. (Letter from Stevenson to Ford, June 6, 1960.)

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Ecocognition: Observation and Interpretation in the Understanding of Climate Change

Experimental results demonstrate the influence of specific cognitive factors in our understanding of climate change and the importance of cognitive science in accurately interpreting observations in environmental science.

MATTHEW J. SHARPS, SIMRAN K. NAGRA, ANDERS PAULSEN, JASMIN MORENO, STEVIE MORTENSEN, TROY FOLMER, AND JANA L. PRICE-SHARPS

In a recent article in the Skeptical Inquirer, David Mountain discussed the tremendous good that the *scientific* environmental movement has created. At the same time, he emphasized an important cautionary note: "Unfortunately, environmentalism and science are not always the same thing. Indeed, throughout its history, environmentalism has been shaped by a range of fringe beliefs that have nurtured a tradition of unscientific thinking about the natural world" (Mountain 2021, 29). Kendrick Frazier's editorial in the same issue also elucidates the critical importance of accurate scientific understanding of environmental issues (Frazier 2021, 4).

Some popular environmental beliefs simply do not survive the test of scientific skepticism—at least not without significant, frequently complex qualification. Old growth forests are beloved; yet old-growth forests, wonderful for spotted owls, are bad for the endangered Kirtland's warbler, as the expansion of old growth reduces the fire-dependent jack pine forests that the warbler requires (e.g., Matthiessen 1987). Specific pesticides are roundly hated, yet the abolition of pesticide deemed environmentally hazardous has been associated with enormous increases in human death rates from malaria (Wilford 1970). These are only two examples. There are many contrary and complex issues in environmental science. However, although a great many environmentalists base their thinking in sound scientific principles, unscientific or "fringe" thinking persists strongly in elements of the global and extremely powerful environmentalist community.

This is dangerous. With nearly eight billion people crowding the planet, environmental protection has perhaps never been more important. Yet effective environmentalism must be based in fact rather than fancy, and it must be well-reasoned more than well-meaning. This is where the concept of *ecocognition* comes in (Sharps and Hess 2010). The basis of this concept lies in our understanding that environmental facts, whether derived from complex science or simplistic fringe thinking, do not stand in isolation. Rather, they are filtered through the very complex processes of human perception and congnition.

This reality is often poorly understood, even within the

sciences. Since the early days of modern science, of Francis Bacon's *Novum Organum* and Isaac Newton's *Principia*, scientists have generally taken a positivistic view of observation and interpretation. The basic concept is that these activities are objective under the rules and aegis of the scientific method and hence generally inviolate and impervious to the psychological characteristic of the scientists themselves (e.g., Gribbin 2006).

Yet this essentially Renaissance/Enlightenment view has ultimately proven inadequate. Scientific observation is not entirely objective but is filtered through the processes of perception and interpretation, resulting in potentially different interpretations of any given natural phenomenon by scientists of different orientations. In the eighteenth century, a British Astronomer Royal dismissed an observer whose observations differed slightly from his own, assuming the complete objectivity of the scientific method; yet the German astronomer Bessel demonstrated that such differentials are inevitable and the product of psychological processes (Hetherington 1988). Similar observational and interpretive bias lay in the early twentieth-century work of astronomer Percival Lowell, who observed and provided dramatic interpretations of the Canals of Mars when no such canals existed at all. We can now characterize the psychological principles involved in these errors (e.g., Sharps 2018, Sharps et al. 2019). Yet even in the face of these lessons from the history of science, implicit beliefs in pure objectivity may be seen today when individual scientists conflate personal opinions with science itself. And when such belief in observational and interpretive objectivity extends to the unfounded opinions of fringe environmentalists, one can readily imagine the cognitive chaos that may ensue.

It is therefore important that observations and interpretations of climate change be as accurate as possible. Climate change is obviously real—and urgent. Widespread scientific consensus has emerged on the potentially catastrophic and even existential results of climate change, as the many natural climate changes of this planet, in the past, have repeatedly demonstrated in detail. The repeated cooling and warming trends of previous glaciations and interstadials, causing numerous mammalian extinctions, serve both as examples and warnings (e.g., Prothero 2006). Climate change is nothing to take lightly; we have to get it right (Nisbet 2018).

But is there any serious question about the accuracy of observation and interpretation in the realm of climate change research specifically? Yes, there is. Several predicted major climate changes have in fact failed to materialize in the timeframes predicted (e.g., Sumner 2016). The fact that observations of oceanic warming in the recent past did not match overestimates of oceanic heating from computer models recently influenced the International Panel on Climate Change (IPCC) to alter the measurements (e.g., Hogan 2019). Observation, interpretation, and theory sometimes do not agree in the complex world of climate change research. There is therefore a need for scientific *psychological* study of the relevant observational and interpretive phenomena in this existentially important realm.

But what is the best framework to begin this important inquiry? For many years, my students and I have addressed eyewitness phenomena in the criminal justice realm (see Sharps 2022 for summary). We have recently applied these cognitive and perceptual principles to "paranormal" observations of such things as Bigfoot and UFOs, demonstrating specific psychological factors involved (e.g., Sharps et al. 2016). Even though such "observations" lie decidedly within the "fringe," they are valuable in that they represent the *extremes* of eyewitness error (e.g., Sharps et al. 2016) and therefore demonstrate continuity in the cognitive principles involved (see Sharps 2022).

We have begun to apply these principles of eyewitness cognition to the scientific realm, initially to the early observations of Martian "canals" noted above (Sharps 2018; Sharps et al. 2019). This approach may prove increasingly useful as the scope and provenance of observations of climate change to be considered is enlarged, even involving observations by untrained amateurs (e.g., Flaccus 2015). A solid understanding of the psychological processes involved in climate observation and interpretation is essential. The research presented here represents an initial effort in this area.

Experimental Framework

We first examined how well untrained adults can interpret samples of climate imagery, then the degree to which their preconceived thinking would influence this interpretation. Finally, we explored psychological characteristics that might further influence this thinking and interpretation. The psychological characteristics addressed here were chosen because they have repeatedly proven to exert complex effects on observation and interpretation in the criminal justice and "paranormal" realms of eyewitness processing, specifically dissociative and schizotypal tendencies (e.g., Sharps 2022; Sharps et al. 2016).

Methods, Materials, and Procedures

Eight pairs of "environmental images" were acquired from public-domain sources of aerial photography. All involved water or ice features in terrestrial landscapes, and, in each pair, there was a time-lapse between the first and second image of the given terrain in which water had increased or ice had diminished as a result of tides, seasonal evaporation, or other causes. The same set of images was also used to create a second condition, in which each pair of images showed the same image twice so that there was no difference between the "before" and "after" images.

Sixty-five men (mean age 19.66, SD = 2.56) and 134 women (mean age 19.16 years, SD = 2.84) were recruited from a multicultural U.S. college population. The breadth of ethnicity and socioeconomic status in this particular sample was similar to that of the current American population. These respondents examined the environmental images described above and were asked, for each pair of images, if ice had been lost to warming or if land had been lost to rising water (depending on the icy or watery character of the given image). They were then asked, on a 1–7 point Likert scale, the degree

to which this loss reflected climate change.

Respondents were also asked, on the same Likert scales, to rate themselves as politically liberal or conservative and to rate the degree to which "The Earth is in danger" from "global warming" and from "climate change." These indices were intended to explore preconceptions potentially important to environmental cognition.

Finally, respondents completed the Dissociative Experiences Scale (DES; Carlson and Putnam 1986) and the Short Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason et al. 2005). These standard instruments address dissociative and schizotypal tendencies, respectively. Particular attention was paid to the "unusual experiences" (UE) subscale of the O-LIFE, which is associated with perceptual aberrations and essentially "magical" thinking; this factor has proven important in the paranormal and forensic realms. The DES measures tendencies to see the world as vague or unreal (e.g. Cardena 1997; DePrince and Freyd 1999). It is important to note that these instruments were used in the *subclinical realm only* here. No issues of mental health or clinical significance were implied, and indeed the tendencies measured here lie on continua in perfectly normal people. However, the psychological proclivities measured by the DES and the UE subscale of the O-LIFE are exactly what we would expect to influence observation and interpretation in the realm of environmental science, as in the realms of criminal justice and beliefs in the paranormal.

Results

First, some good news: Untrained people are pretty good at telling whether two environmental images are the same or different. Out of 198 respondents, 170 were effectively able to tell, even if some weren't entirely sure, that ice or land had diminished in those image pairs that were in fact different. Out of 198, 196 were able to tell, at various levels of certainty, that no such loss had occurred in the paired images that were identical. So far so good.

However, recall that the before-and-after images simply reflected loss of ice or higher water levels. To avoid any contamination of the data, *we*, the investigators, didn't know the causes of these changes. Normal seasonal change? High or low tides? Local weather variation? There are a lot of reasons ice melts and water levels rise and fall. No causal information of any kind, in these pictures of local ice and water conditions, was provided in any way.

Yet many of our respondents found a cause anyway, depending, as suggested above, on their assumptions and preconceptions. These analyses were, of course, only conducted on responses to pairs of images that were in fact different on a before-and-after basis. Political leanings did not play a significant role here. Participant self-identification as liberal or conservative did not significantly influence endorsement of the statement that the perceived loss of ice or rise of water on each item reflected climate change.

This result was encouraging. Initially, so was our result concerning global warming; a belief in the danger of global warming had no significant influence on the perception that the environmental changes depicted in our images reflected it. However, in recent years, the term *global warming* has been largely supplanted in media by the term *climate change*, and the next result to be discussed perhaps reflects the extraordinary influence of the language used by media on climate beliefs. Regression analysis showed that those who believed climate change to be a danger to the earth significantly rated the differences in our environmental images as due to climate change more than did those who expressed less belief in climate change danger, $R^2 = .031$, $F(1,196) = 6.36$, $p = .012$, $\beta = .177$. The reader should recall that no information on the source of these image differences was provided; yet if the observer believed more strongly in the danger of climate change, he or she was significantly more likely to interpret observed differences as caused by that factor. Only the language of *climate change*, rather than the former *global warming*, produced this effect; however, the effect was there and wholly unjustified within the framework of this experiment.

Bransford and Johnson (1972) demonstrated the extreme importance of prior frameworks for understanding in the development of our thinking and memory about evidence (see also Sharps 2022). The present findings, consistent with the hypothesis advanced above, found this to be dangerously true in the realm of climate change. Respondents were more likely to interpret observed differences in environmental imagery to climate change if they believed in its dangers, *even when there was no observable connection between the observation and that interpretation*. The more dated term *global warming* had no such effect, indicating that current media may be an important source of relevant prior frameworks, an issue for future research. Yet not everyone agrees with everything media promotes, even in an area as important as climate change research. So what additional psychological sources could be responsible for the creation of the necessary mental contexts?

Recall that the third thrust of this initial research effort was to examine possible effects of subclinical dissociation and schizotypal tendencies (measured respectively by the DES and the O-LIFE UE scale) on environmental observations and interpretations. Within the limits of the present study, neither of these factors directly influenced the tendency of respondents to attribute environmental image differences to climate change when, as detailed above, no such attribution was defensible in terms of logic or evidence.

The bad news is that *both* of these subclinical psychological factors contributed to the preconceived notions that in turn *did* contribute to these attributions. Both DES and O-LIFE UE scores were significant on the belief that climate change is a danger to the world, $R^2 = .020$, $F(1,196) = 3.99$, $p = .047$, $\beta = .141$, and $R^2 = .032$, $F(1,197) = 6.51$, $p = .011$, $\beta = .179$. Those who endorsed climate change as a grave world danger most strongly tended to be those with more dissociative tendencies—in which the immediacy of the real world may seem somewhat remote—as well as those who tend more toward ideas of the centrality and uniqueness of their own unusual experiences (O-LIFE UE scale; Mason et al. 2005).

There is nothing pejorative in this characterization; ele-

vated DES and UE scales have nothing to do with clinical issues or "mental illness" in this context. Our respondents were perfectly normal people. DES and UE tendencies lie on a continuum across the entire human population, and we are focused here entirely on *subclinical* levels of these scales. We must also reemphasize that there is nothing abnormal or unreasonable about concern with climate change. What we are examining here is not the concept of concern with climate change; it is the *range* of that concern in terms of *relative elevation*.

And in these terms, we find that elevated UE and DES scores are associated with *elevated* concern with the danger of climate change, which in turn is directly associated with the tendency to see environmental changes as climate change–induced, even when no such evidence is provided and when many other natural processes could be involved.

Conclusion

Like climate research, statistical analyses are complex; indirect effects, via intermediate variables, can be as important as direct effects of one variable on another. In the present research, we have demonstrated that specific strong beliefs in the danger of climate change, held as a prior framework for understanding, can reduce *scientific skepticism* in the environmental realm because such beliefs may result in an attribution of cause that is scientifically unjustified in terms of logic and evidence. We have also shown that specific subclinical personal attributes, lying in dissociative processes and beliefs in "unusual experiences," can contribute directly to strong beliefs in climate danger. This in turn may contribute to the unwarranted attribution of environmental variations, which may or may not be local in nature, to large-scale climate change.

Climate change is real—and unspeakably dangerous, as the climate changes of the past have taught us (e.g., Prothero 2006). We must therefore have the best observations—and the most scientifically sound interpretations of those observations—to guide public policy in this critical area. This is true both for scientists and the citizens who make decisions on the basis of the available science. Yet a seventeenth-century faith in pure objectivity will not be beneficial in this regard in the modern world. This research demonstrates that preconceived ideas, and the psychological processes that may lead to those ideas, are crucial elements of the ways in which we as humans envision climate change. Psychological science is therefore of significant importance to the rather convoluted concept of the *understanding of our own understanding*, to the ways in which we create interpretations of our observations of the natural world. This is important for any area of the natural sciences, but it may prove especially important for the critical realm of climate science. ■

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The Night Begins to Shine: The Tapetum Lucidum and Our Backward Retinas

The inverted orientation of the vertebrate retina has long perplexed scientists and is sometimes offered as an example of poor design in nature, a claim frequently challenged by creationists. A new analysis adds further evidence by showing that the tapetum lucidum has evolved in many separate lineages to compensate for the limitations imposed by inverted retinas.

NATHAN H. LENTS

The "argument from poor design" as evidence for evolution dates back to Charles Darwin himself. The dysteleological argument, as it is formally known, goes something like this: If the world and everything in it were created by an omniscient and omnipotent creator, why are there such clear examples of quirks and glitches in living organisms, including humans? The argument is seldom used as evidence against the *existence* of God but rather as evidence against creationism as the explanation for how life unfolded on the planet.

On the other hand, if we accept universal common descent, as all the available evidence supports, we understand that the randomness of mutation, gene duplication, horizontal transfer, and other unguided molecular tinkering is the source of all variation. Further, we appreciate how natural selection, genetic drift, etc., have shaped the history of all species, and we fully expect instances of suboptimal design at all levels of life—from molecules to ecosystems. Evolution is aimless, clumsy, and cruel.

The vertebrate retina has often been held as a prime example of poor design in nature because it appears as though the photoreceptors are wired in backward—that is, they face in the backward direction rather than facing toward the incoming light (Miller 2005; Novella 2008). Many evolutionary theorists have mused about this curious arrangement (Dawkins 1986; Lents 2018). It would be strange enough that the photoreceptors are nestled behind several layers of tissue with vasculature interspersed, which prevents a clean capture of incoming light and reduces sensitivity. But what makes this even more strange is that cephalopods have the same type of retina but with the photoreceptors facing forward in the logical way (Figure 1).

Cephalopods (squids, octopi, and nautiloids) have the same type of camera-like eye that vertebrates have, a striking example of convergent evolution (Serb and Eernisse 2008). But there are several profound differences, including the genetic and developmental programming, that reveal the separate origins of the vertebrate and cephalopod eyes. The inverted nature of the photoreceptor cells relative to one another is another striking difference between them.

The more straightforward arrangement found in cephalopods allows an unbroken sheet of photosensitive neurons with their axons projecting backward and collecting into the optic nerve. The inverted arrangement found in vertebrates, however, means that the axons project forward. This adds to the tissue that stands between the light and the receptors and, worse, forces the axons to converge *in front* of the retinal layer and then plunge back through the retina in the posterior direction to head to the brain (Ramachandran 1992).

The point at which the photoreceptor axons bundle together in vertebrates is called the optic disc, which creates a blind spot not far from the center of the visual field. In humans, this blind spot is rarely noticeable because of how much the visual fields of our two eyes overlap, but in animals with a

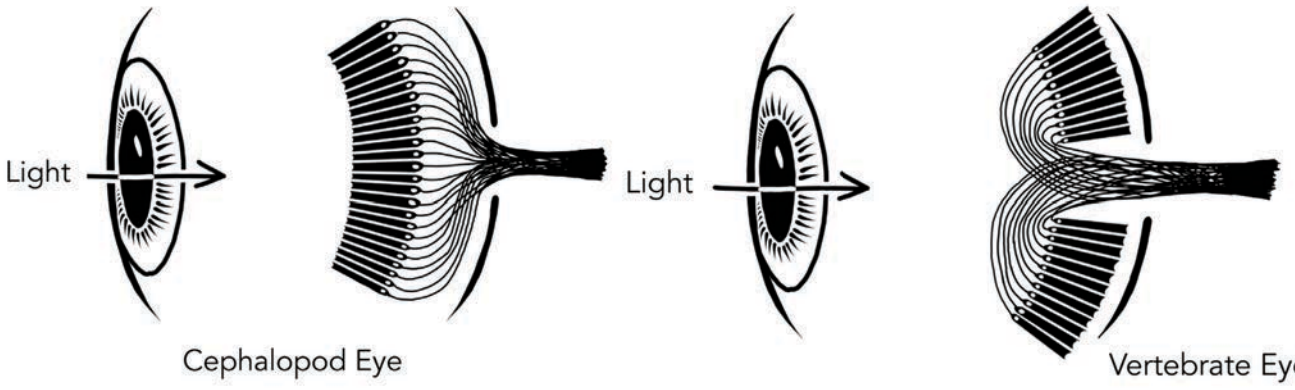

Figure 1. The inverted orientation of vertebrate photoreceptors. Image by Donald Ganley from *Human Errors* (Lents 2018).

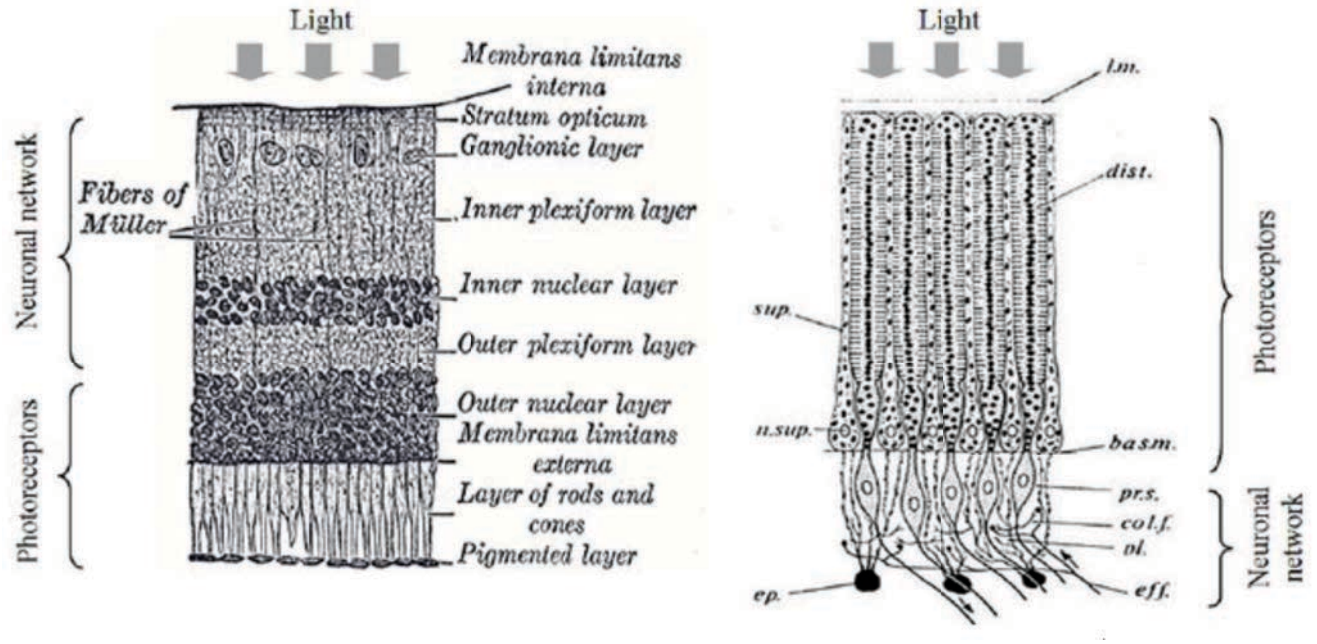

Figure 2. Tissue layers in the vertebrate retina (left from Gray 1878) and the cephalopod retina (right from Young 1962). The latter is far simpler and more streamlined.

wider field of vision, whose eyes face more to the sides of their heads, such as most birds and mammals other than primates, the blind spot is a real hinderance (D'Ombrain 1936). (For a good demonstration of how to find your own blind spot, see Lohner and Science Buddies 2020.) This is why scientists have called the vertebrate retina an example of poor design. There is no reason the photoreceptors must be oriented backward, and it comes with real costs that they are.

Creationists, of course, take umbrage with this claim. Intelligent design proponents in particular have mounted a rigorous defense of the design of the vertebrate retina, noting several adaptations in vertebrates that enhance the visual acuity and maximize photodetection that are not present in cephalopods—though they have not managed to get their arguments published in peer-reviewed scientific journals (Bergman and Calkins 2005). Examples include the matching of blood vessels with metabolic demand and neural circuitry that compensates for the light scattering that occurs when photons pass through tissue to reach the photoreceptors (Figure 2).

This completely misses the point. These adaptations are only necessary because the retina is inverted to begin with. These are compensatory co-adaptions to *make up for* the inverted nature of the vertebrate retina. And that's why they aren't found in cephalopods.

In a paper published in the October 2022 issue of *Bioessays*, Gerald Barclay, Sam Vee, and I argued that the tapetum lucidum is another such compensatory adaption (Vee et al. 2022). The tapetum is a structure in some vertebrates that lies just behind the photoreceptors and reflects incident light back toward the front of the eye, leading to the phenomenon of *eye shine*. This photoreflection creates a second chance for photons that initially slip past the photoreceptors to collide with them as they make their second pass though the retina. As such, the tapetum considerably boosts detection of light in dim conditions (Hesse and Willemse 2012).

Not all vertebrates have tapeta. They are found almost exclusively in nocturnal land animals and fish that live in murky or deep waters. This makes sense because only in such environments would the tapetum offer much value. However, what is most surprising about the tapeta is the incredible amount of diversity there is among the various species that have it. There are many kinds of tapetum that display totally different physical structures, cellular organization, locations within the retina, and even the materials with which they are constructed. For example, some tapeta are made of coiled collagen fibers, others are made of stacked zync cysteine crystals, while still others are made of guanine or riboflavin (Ollivier et al. 2004).

We performed a phylogenetic analysis and found that the many types, histological arrangements, and chemical compositions of the tapetum are the result of numerous instances of convergent evolution. The tapetum appears to have evolved, disappeared, and evolved again countless times throughout the vertebrate clade (Figure 3, next page).

However, cephalopods do not have a tapetum. This is telling because cephalopods have the same type of eyes and occupy the same murky waters as many of the fish species that do have tapeta. And cephalopods have an even older evolutionary origin than vertebrates, so they have had more time to evolve this highly advantageous structure. And yet, as far as we know, they never have.

The reason we propose that cephalopods have not evolved a tapetum is the cephalopod retina, with its forward-facing photoreceptors, is already as optimized as it can possibly be for the capture of photons under conditions of dim light. Indeed, while direct comparisons have not been made, experiments with isolated retinas have revealed that octopus retinas rival the photosensitivity of felines, the most sensitive known

vertebrate retinas (Wood et al. 1987). And they do so without a tapetum. With their axons projecting backward, the cephalopod photoreceptors can pack together tightly and form an unbroken sheet of photosensitive tissue, which, besides being simpler, is also more efficient, allowing a more streamlined retinal architecture (see Figure 2). In vertebrates, however, a tapetum is required to capture every last photon because so many of them slip past the photoreceptors on their first pass.

It may also be possible that there are some genetic or microanatomical constraints in the cephalopod retina that preclude the emergence of the tapetum. However, the sheer number of ways that the tapetum evolved in vertebrates argues against this.

Further, tapeta have also been discovered in spiders, insects, and crustaceans, which have an entirely different kind of eye (Benson and Suter 2013). And, again, the presence and absence of the tapetum throughout the various clades of arthropods argues for repeated instances of convergent evolution. Within the compound eyes of spiders, there are two distinct retinas. The primary one has its photoreceptors oriented in the verted arrangement, like cephalopods, while the secondary retina is inverted, reminiscent of the vertebrate retina. In some spiders, these inverted secondary retinas have tapeta, while the primary retinas do not have tapeta (Morehouse et al. 2017). Yet again, we see a correlation between the inverted retina and the necessity of a tapetum to assist in photosensitivity.

We therefore offer the hypothesis that the tapetum lucidum is a compensatory co-adaptation in the vertebrate retina made necessary by the inverted arrangement of the photoreceptors.

Experiments to test this hypothesis are challenging but possible. For example, scientists could make direct comparisons of the photosensitivity of isolated cephalopod and vertebrate retinas *in situ*, with and without tapeta, followed by the grafting of a tapetum onto a cephalopod retina to observe if photodetection is enhanced. These types of experiments require a great deal of care and many controls, but it should be possible to test this hypothesis. The testing of predictions made by hypotheses is the hallmark of science and a key feature that separates scientific ideas from pseudoscientific ones such as intelligent design.

It is our hope that this hypothesis will provoke robust discussion and future research that will either refute or lend support to this idea. Even if it is proven incorrect, the theoretical and experimental work that this hypothesis inspires will help to *illuminate* the function and evolution of the vertebrate and cephalopod retinas. If you'll pardon the pun. ■

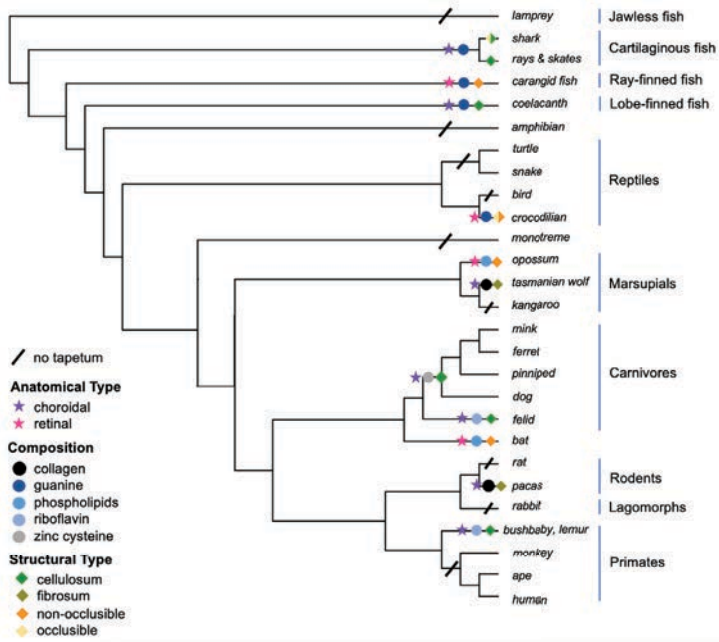

Figure 3. Phylogenetic tree of the many types, structures, and compositions of the tapetum lucidum in vertebrates (Vee et al. 2022; used with permission)

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‘I Can’t Believe You Believe That’: Identifying Unsubstantiated Claims

Skeptical, science-minded people are sometimes shocked by the various unsubstantiated claims other people accept, but what makes those claims unsubstantiated? A cognitive psychologist discusses how to identify different types, their dangers, and how to respond to them.

D. ALAN BENSLEY

Is it true that:

1. A cabal of liberals run sex rings that traffic and murder thousands of children each year?
2. Shape-shifting lizard “people” from another planet impersonate Earth’s world leaders to secretly run the world?
3. Research has found that chemicals in vaccines cause autism, which the medical establishment is covering up?
4. Certain individuals have extraordinary abilities, such as psychics who can move objects with their minds and witches who can harm people with their magic?
5. People typically use only 10 percent of their brains but if they used more, they would improve their performance to very high levels, even acquiring superhuman powers?
6. Over long periods of time, organisms have evolved to their present forms through natural selection?

As you likely suspect, the first five of the above questions contain claims that are unsubstantiated—claims that have not been supported by high-quality evidence. The sixth one, the modern synthesis of Charles Darwin’s theory, has been substantiated by much scientific research in fields ranging from geology to molecular biology. The first two questions are unsubstantiated conspiracy theories. Each provides a view alternative to conventional accounts and asserts that conspirators (often powerful people) are colluding to execute a hidden, nefarious plot. The third question is pseudoscience, because it falsely asserts that science has shown a link between vaccines and autism despite the high-quality epidemiological studies showing no connection. The fourth question describes people with paranormal and supernatural abilities, which high-quality scientific research has not consistently supported. The fifth question is a psychological misconception or a mistaken conception of how the mind and brain work that is unsupported by high-quality psychological research and better explained by an alternate scientific theory.

Acting on unsubstantiated beliefs, such as the ones above, can be harmful, so it is important to be able to identify different types when possible. For illustration purposes, I will focus on four common types. I’ll begin with unsubstantiated conspiracy theories, which in recent years have been associated with multiple deaths and an attack on the U.S. Capitol.

Conspiracy Theories

When people call something a “conspiracy theory,” they often mean it is an outrageous, merely imagined connection between people and events. However, not all conspiracy theories are outrageous, and some have been verified. For instance, the conspiracy theory that the September 11, 2001, attack on the World Trade Center was an inside job was not outrageous. However, when scientists, engineers, and other experts examined the evidence for the inside job theory, they found that it was unsubstantiated. Instead, forensic evidence and Osama bin Laden’s own confession better supported the conventional conspiracy theory that bin Laden and jihadists had organized and conducted the attack. As such, we consider the jihadist theory the actual conspiracy, which is now part of the received history of events.

Most conspiracy theories remain unsubstantiated because there are just too many to carefully examine. New ones, often resembling older ones, seem to pop up with each new perceived threat or objectionable event, continuously arising regardless of whether the person believing it is a liberal or conservative (Brotherton 2015). What is important is identifying potentially harmful conspiracy theories and unsubstantiated beliefs.

The best way to decide if a conspiracy theory or other science-related claim is substantiated is to see if it survives rigorous, scientific analysis and testing. For instance, epidemiological studies have found no support for a connection between chemicals in vaccines and autism, so the medical establishment cannot be hiding a connection because none exists (Offit 2008). Unsubstantiated claims become more

clearly false when high-quality evidence supports an alternative explanation. Even when conspiracy theories and other questionable claims have not been scientifically examined, we still consider them unsubstantiated because high-quality evidence has not been mustered to support them. The burden of proof is on proponents of new, especially extraordinary, claims to provide high-quality evidence to support them. We also call unsubstantiated claims "unfounded," "unwarranted," and "epistemically suspect." Regardless of which label is applied, we should view all unsubstantiated claims with skepticism.

A second way to evaluate an unsubstantiated claim is to examine its support among a consensus of credible experts from a relevant subject area. For instance, numerous foreign policy experts agreed that bin Laden's confession of responsibility for the 9/11 attacks was credible, countering the inside job conspiracy theory. In contrast, conspiracy beliefs often originate from sources with dubious expertise. For example, David Ickes, before originating the lizard people conspiracy theory, was a soccer player and sports announcer with little training in either astronomy or political science. His lack of relevant experience raises questions about his credibility and should make us more skeptical of such claims.

A third way to evaluate many unsubstantiated claims, including ones that have not been directly investigated scientifically, is to evaluate their scientific plausibility (Bensley 2018). Scientific plausibility provides a way to make an initial judgment of the likelihood that some science-related claim is true using what is already known from relevant scientific research. The more unreasonable the new claim seems, the more skeptical we should be of it. An initial evaluation of a claim's scientific plausibility is useful, but it is less definitive than results from rigorous, high-quality research. Also, because claims that were once implausible—such as space travel—are now commonly accepted due to scientific and technological advances, plausibility judgments should be based on current scientific knowledge.

The "lizard people" conspiracy theory is a good example of a set of claims that are scientifically implausible given what we now know from physics and astronomy as well as the unlikelihood of visitation of aliens from extremely distant planets. Despite the theory's implausibility, some people find it credible. For instance, in 2018, Bucky Wolfe killed his brother James, stabbing him in the head with a four-foot sword, because he believed his brother had been replaced by a lizard person. In his 911 call, Wolfe said, "Kill me. Kill me. I can't live in this reality" and "God told me he was a lizard" (Green 2019). These statements suggest Wolfe was experiencing a psychotic episode and are consistent with his statement to authorities that he had been diagnosed with schizophrenia (Sommer 2019).

Like many people, Wolfe had endorsed the QAnon conspiracy, but few of these people likely have mental disorders. Instead, research suggests that people who more strongly endorse conspiracy theories and other unsubstantiated claims tend to be less able to think critically about psychological questions and have a more intuitive and less scientifically skeptical thinking style (Bensley et al. 2014; Bensley et al. 2022). Making it even harder for people to recognize unsubstantiated claims, pseudoscience—another type of unsubstantiated claim—is disguised to look like real science.

Pseudoscience

The name "pseudoscience" tells you what it is: *false science* masquerading as real science. Proponents of pseudoscience assert that certain theories, practices, or effects are scientific—i.e., have been supported by scientific research using high-quality scientific procedures—even though they have not been. For instance, the claim that thimerosal in MMR vaccines causes autism is pseudoscientific because its proponents persist in claiming it is scientific despite the claim being inconsistent with high-quality scientific evidence (Bensley 2018). The initial support for a connection between autism and vaccines came from a fraudulent and poorly conducted case study that was somehow published in the prestigious British medical journal *Lancet*. Despite retraction of the article and its main author, Dr. Andrew Wakefield, losing his medical license, some people still claim that scientific research supports a connection. The scientifically predictable increase in measles among the unvaccinated followed as a result.

The vaccine-autism connection seems to involve pseudoscience, but labeling a field or approach "pseudoscience" is controversial. The boundary between certain forms of pseudoscience and specific sciences is sometimes fuzzy (Pigliucci 2010). However, applying certain criteria to distinguish specific, prototypical examples of pseudoscience from sciences can be a useful tool for science educators (Bensley 2018).

Astrology provides a clear example of a pseudoscience when astrologers claim it is scientific despite not actually taking a scientific approach. In contrast to the specific predictions tested by astronomers and psychologists, astrologers seldom test their vague predictions about personality, which are based on ancient mythical figures found in constellations. It is scientifically implausible that the position of stars and planets at the moment of one's birth determine a person's personality traits. Moreover, astrologers offer low-quality evidence, such as testimonials, anecdotes, and statements of authority to sup-

Figure 1. Ten-year-old Candace Newmaker (left) suffocated to death after her therapists (right) tried to simulate her birth by forcing her to wriggle through tight blankets, an unsubstantiated procedure.

port their claims and have not revised their core assumptions in thousands of years despite a lack of scientific support.

Although seemingly harmless, astrology is a dubious way to make important decisions. In 1988, Donald Regan, adviser to President Ronald Reagan, reported that the president timed meetings and made other executive decisions based on advice from Joan Quigley, his wife's personal astrologer, who claimed to be a scientific astrologer (Regan 1988). However, it is not known whether basing his decisions on pseudoscience caused harm.

A clearer example of harm from pseudoscience is the death of ten-year-old Candace Newmaker (Mercer 2015). Candace, shown on the left in Figure 1, had been in foster care and was adopted by Jeannie Newmaker, a registered nurse. Because Candace was having trouble adjusting and showed persistent behavior problems, a therapist suggested they try a type of attachment therapy. Jeannie and Candace traveled to Colorado for two weeks of this therapy with Julie Ponder and Connell Watkins, shown on the right of Figure 1. Her therapists assumed that Candace's problem was that she had not attached to her new caregiver. They tried an unsubstantiated procedure, reenacting the birthing process to help Candace reattach. In a crude simulation of the birthing process, they wrapped Candace in a blanket and pillows, forcing her to try to wriggle through as they restrained her. Unable to wriggle through, she cried, vomited, and said she couldn't breathe. After an hour, she suffocated.

Despite the scientific implausibility of this birthing procedure, Candace's therapists probably thought they were using a scientifically sanctioned therapy because they had learned about it in a professional workshop. Unlike many paranormal believers discussed next, they likely did not associate this with some supernatural or scientifically inexplicable activity.

Paranormal Belief

Paranormal believers often claim that some people have extraordinary abilities, inexplicable by conventional science. Their unsubstantiated claims are often scientifically implausible, such as claiming that people are capable of extrasensory perception (Reber and Alcock 2020). Yet self-styled "paranormal investigators" often support their unsubstantiated claims using pseudoscientific procedures. For instance, to support the claim that ghosts exist, they use scientific equipment, such as electromagnetic field (EMF) detectors, in procedures that only *appear* to be scientific. Ignoring the fact that electromagnetic fields vary from place to place, they do not precisely identify specific energy signatures that are reliably associated with such events. Nor do they realize that the more plausible explanation for the EMF changes they observe is ordinary variation.

Likewise, many paranormal believers make a categorical thinking error by assuming that the mind, or more often the spirit, is nonphysical. This makes the idea of an immaterial spirit that can separate from the physical body seem plausible, but neuroscience strongly suggests that the brain is a physical system that functions to produce mental experience. How, then, could a ghost without a physical body and functioning brain use energy to process the information necessary for perception and communication needed for interaction with living people?

Moreover, the common paranormal belief that some people possess special abilities that defy conventional explanation has been repeatedly debunked. Magician and skeptic James Randi showed that Uri Geller's claim to be able to bend spoons with his mind was merely a magic trick, as were other apparently extraordinary feats. More harmful is the paranormal claim that witches with supernatural powers cause diseases and other natural disasters. Karen Palmer (2010) has described how people in Ghana accused of witchcraft have been tested for it by observing on which side a chicken flops when it is killed. This paranormal practice makes no pretense of being substantiated by science, yet it has sent thousands of those convicted to prison camps.

Some of the strongest evidence that a paranormal claim is unsubstantiated comes from psychological and neuroscientific research on the out-of-body experience (OBE). Theosophists in the nineteenth century advanced the idea of astral projection, or soul travel, whereby the spirit of certain adepts could leave the body by traveling from the physical plane to the spiritual one. Of course, a nonphysical spirit that moves from the body to a nonphysical realm is a metaphysical claim, fraught with issues related to the mind-body problem. But scientific research is accumulating to show that the OBE is an illusion of sorts that can be explained in natural terms. Supporting this, neuroscientists have been able to reliably produce the OBE by stimulating the temporal-parietal junction in the brain (Blanke et al. 2002), and other researchers have induced an OBE-like illusion using devices that displace the image of the body (Ehrsson 2007).

The paranormal idea of astral projection seems even more clearly unsubstantiated in light of a promising scientific theory that proposes that the OBE occurs when the mental and brain processes that give rise to "in-body" perception are disrupted. This disruption in perception tends to occur under conditions that destabilize perception, such as when a person is falling asleep, taking dissociative drugs, experiencing extreme stress, or having an epileptic seizure. Perception of one's body requires integration of the activity from different brain areas that represent visual and bodily aspects of the experience, including balance. The temporal-parietal junction is a brain area that helps integrate this information and supports vestibular function and the perception of balance. People with vestibular damage are more prone to having an OBE. This account is more plausible and consistent with scientific research than assuming an immaterial spirit can have mental experience and leave the body. Correcting this misconception about how mental experience and brain function are related moves the OBE from the mysterious realm of the supernatural and paranormal to the scientific realm of natural events.

Psychological Misconceptions

Psychological misconceptions are a type of unsubstantiated

belief that occur when someone endorses an incorrect, often commonsense, idea about the mind, brain, or behavior. A psychological claim is unsubstantiated when it has been tested and lacks support from the bulk of relevant, high-quality scientific studies. A claim is even more clearly a psychological misconception when high-quality scientific research, offering a better explanation, supports an alternative conception or theory.

A good example of this is the psychological misconception that the average person uses only 10 percent of the brain. As any good cognitive neuroscience textbook makes clear, research on the brain shows that all parts of the brain are used in a coordinated fashion, depending on the task and function, just not all at once (Banich and Compton 2018). Perhaps, due to a lack of knowledge of the brain, people often endorse this misconception, as numerous studies have shown. Alarmingly, in one study, 6 percent of neuroscientists endorsed it (Herculano-Houzel 2002). This raises the frightening prospect that a neurosurgeon who acted on the misconception might be more willing to remove more of the brain, falsely believing that there is 90 percent to spare. But the larger problem with psychological misconceptions is that they often contribute to other types of unsubstantiated claims.

Real-World Identification of Unsubstantiated Claims

Identifying a specific type of unsubstantiated claim in everyday life may not be easy. A closer look at the previous examples reveals that although each might appear to be just one type, other types are often involved. The 10 percent of the brain example is not only a psychological misconception but can also involve pseudoscience when advertisers claim that their products increase the amount of brain people can use. It can even become a paranormal claim when people are said to acquire paranormal powers by using more than 10 percent of the brain (Clark 1997). Likewise, accepting the pseudoscientific claim that chemicals in vaccines have been scientifically shown to cause autism is also a conspiracy theory when combined with the claim that the medical establishment is hiding the connection. Moreover, the availability of high-quality genetic and neuroscientific research on autism that better explains it makes the vaccine claim seem to involve a psychological misconception.

This overlap in different types of unsubstantiated claims in an example can make it more difficult to distinguish one type from another, but it is not fatal to recognizing that the example contains an unsubstantiated claim. If any part of a complex example contains an unsubstantiated claim, then you should be skeptical of it. Also, the forementioned guidelines for identifying unsubstantiated claims should work. The best strategy is to examine any high-quality research investigating the claim. Second, you should consider the credibility of the source. Does the claimant possess relevant knowledge and expertise that increases their credibility? Third, if no research has been done on the claim, ask yourself whether what is known in related areas of science makes the claim seem less plausible. The less high-quality evidence supporting it, the less credible you find the source, and the less plausible it seems to you, the more skeptical you should be.

The same guidelines could be adapted for other people. (See also some helpful suggestions in the March/April 2022 issue of Skeptical Inquirer in Massimo Pigliucci's column "How to Talk to a Science Denier.") So, if you encounter someone making an unsubstantiated, implausible claim, do not act shocked. Instead, politely ask the person, "Why do you think that?" Gently encourage them to think about the quality and source of the evidence supporting the claim and whether the claim seems reasonable given other things that are known. Remember, too, that scientific skeptics should be open-minded in evaluating new claims that other people make (you could be wrong). ■

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[THE TIME WARP: SKEPTICISM REVISITED—FROM THE FUTURE

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On the Origin of Skeptical Inquirer

"The Time Warp: Skepticism Revisited—from the Future" is the first of an occasional series examining skepticism by looking back on early issues of the Skeptical Inquirer.

Welcome aboard, amigos! In "The Time Warp," we aren't limited to present-day examination. We use Skeptical Inquirer's rich history to examine skepticism … from the future.

On this voyage, we travel to Fall/Winter 1976 to examine the original Skeptical Inquirer (Vol. 1, no. 1).

Some cultural context to summon your late 1976 zeitgeist: "Disco Duck" became a number 1 hit (October 16). Jimmy Carter defeated Gerald Ford in the United States presidential election (November 2). Classic horror film *Carrie* brought telekinesis and a solid anti-bullying message to the big screen (November 3). Moviegoers probably consumed no red M&Ms because Mars discontinued them in 1976 due to the red dye scare.

This was the milieu when the makers created Skeptical Inquirer. It wasn't even Skeptical Inquirer back then. It was *The Zetetic*. Marcello Truzzi served as editor.

Truzzi and others must have sensed that the term *zetetic* was esoteric, even for the intelligent people who appreciate skepticism. The page following the Table of Contents provided a solitary definition:

> ZETETIC 1. *adj*. proceeding by inquiry. 2 *n*. skeptic, seeker; *specif*. one of a group of Pyrrhonist philosophers. —*Webster's Third New International Dictionary*

Truzzi reinforced the definition in an editorial, but the title diminished quickly. *The Skeptical Inquirer* was added as a subtitle on the third issue (Fall/Winter 1977). *The Zetetic* became the subtitle on the fourth issue (Spring/Summer 1978), and the Fall 1980 issue omitted *The Zetetic* altogether.

THE ZETETIC
Published by The Committee for the Scientific Investigation of Claims of the Paranormal
FEATURING
Wallis on Dianetics
Westrum on Expert Witnesses
Omohundro on von Däniken
Fix on Biorhythms & Sports
Hyman on Uri Geller
VOL. 1 NO. 1
FALL/WINTER 1976

The cover lacked the familiar issue-related theme. It had an off-white background and some tasteful magenta artwork possibly representing an ornate full-body mirror, a large monster's torso, or a decorative candle that sat timelessly in my great aunt's apartment.

Some Skeptical Thoughts from the Time

Roy Wallis provided a review and sociological analysis of Dianetics, L. Ron Hubbard's system for mental well-being.

Gary Alan Fine demonstrated that professional psychics' predictions differed from those provided by undergraduates. Fine suggested that the professional predictions reflected tools of the trade.

Ron Westrum used scientists' collective statement against astrology to consider whether scientists should exert influence in this manner. Westrum's concerns included appealing to experts' authority, experts lacking appropriate qualifications, and expert fallibility generally.

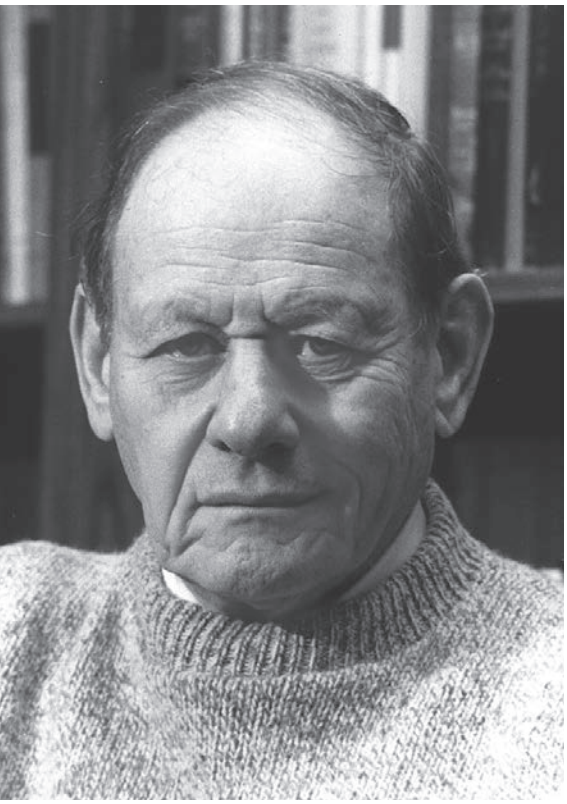
Paul Kurtz and Lee Nisbet defended scientists' anti-astrological statement, noting that the scientists explained the nature of their objections and that scientists should protect the public from irrational claims.

A. James Fix examined whether biorhythms influence human performance on twenty-three-, twenty-eight-, and thirty-three-day cycles (see also *The Zetetic* Vol. 1, no. 2, p. 107). Fix used data from the 1975 Major League Baseball season and did not find any evidence to support purported biorhythms.

John T. Omohundro explained why *Chariots of the Gods?*—Von Dänikan's book about extraterrestrial influence on ancient civilizations—is a hot mess.

Random Shout-Out

According to the Committee News Notes, Dr. Kavoor, at eighty years of age, was traveling India "denouncing the hundreds of mystics in that area as humbugs and criminals" (88). Kavoor offered 100,000 rupees (approximately $12,000) to anybody who could perform miracles under controlled conditions. Bravo, Dr. Kavoor!



Paul Kurtz, founder of the Committee for Skeptical Inquiry

Deep Dive

All these topics are worthy of deeper consideration, but I was riveted by the description of skepticism generally. The Truzzi and Kurtz editorials about the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) are as relevant today as they were when Carrie was fraudulently elected prom queen.

Truzzi referred to the growing belief in the paranormal and called *The Zetetic* CSICOP's official "organ" (3). Truzzi did not clarify which organ—another place where skeptics and paranormal supporters might disagree.

Truzzi made several points that remain fundamental to skepticism. These include 1) balancing openness to new evidence with skepticism about anomalous evidence; 2) the evolving nature of science and the paranormal; 3) the need to require extraordinary proof for revolutionary claims; 4) using diverse forms of expertise to investigate paranormal claims; 5) the burden of proof being on the claimant; and 6) considering paranormal explanations credible only when they are more useful than nonparanormal explanations.

The Truzzi and Kurtz editorials about the CSICOP are as relevant today as they were when Carrie was fraudulently elected prom queen.

Truzzi encouraged searching for truth rather than preemptively dismissing the paranormal. Truzzi wanted to publish findings regardless of whether results favored paranormal or skeptical positions. Truzzi even hoped that future issues would include exchanges of viewpoint. Kurtz likewise refuted claims that the Committee was on a paranormal witch hunt and supported an objective and careful examination of paranormal claims. In that spirit, readers might notice that *The Zetetic* became Skeptical Inquirer, not *Skeptical Defender*.

Truzzi concluded by emphasizing CSICOP's "exclusive concern with *scientific* investigation and *empirical* claims" (5) rather than nonempirical or mystical claims. In so doing, Truzzi encouraged a buffer between skeptical inquiry and broad religious belief.

The Truzzi and Kurtz editorials are so consistent with contemporary skepticism, I think Skeptical Inquirer could reprint them today, without dates, and readers wouldn't find them peculiar.

The only out-of-place sentiment seems to be imagining the journal as an exchange between skeptics and paranormal promotors. This type of exchange has occurred (see, for example, the defense of the Mars Effect, Winter 1979/1980, p. 31), but the publication of pro-paranormal work has been rare.

In retrospect, the infrequency of pro-paranormal pieces is perhaps not surprising. Scholars sometimes characterize pseudoscience as lacking scientific progress. Perhaps paranormal promoters don't publish frequently in Skeptical Inquirer because they don't have compelling new evidence to share or they anticipate receiving unwanted criticism. Alternatively, skeptics might prefer articles that support their preexisting views (a.k.a., a congeniality bias), and Skeptical Inquirer gravitated in that direction as a result.

Post-Warp Summary

The passage of time allows us to consider: Why do the 1976 principles of skepticism resonate over forty-six years and 237 issues later?

One possibility is that early descriptions of skepticism, promoted by greats such as Truzzi and Kurtz, shaped the skepticism that followed. The 1976 vision of skepticism was reinforced by subsequent communication, such as Kendrick Frazier's 1978 editorial (Spring/Summer 1978) and Carl Sagan's article "The Burden of Skepticism" (Fall 1987).

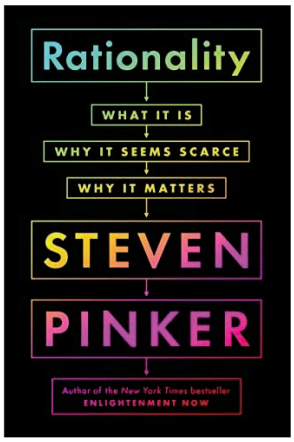
Skepticism might naturally take a particular shape because it addresses the same ongoing social problem—promotions that undermine science and reason.

Alternatively, skepticism might naturally exist in a state that encourages a particular type of description. The promotion of scientifically unconventional claims is ubiquitous, and focusing on testable claims seems sensible enough. Accordingly, skepticism might remain consistent because it addresses the same ongoing social problem—promotions that undermine science and reason.

Regardless, CSICOP's founders deserve immense credit for sensing the moment and organizing the movement devoted to promoting skeptical inquiry. Contemporary skeptics continue this labor of love, working from a foundation formalized in 1976. ■

Reason's Valiant Champion

Richard Dawkins



Rationality: What It Is, Why It Seems Scarce, Why It Matters by Steven Pinker. New York, NY: Viking Publishing, 2021 (978-0525561996). 432 pp. Hardcover, $14.99.

Just another run-of-the-mill, middle-of-the-road Pinker volume. Which is another way of saying it's bloody marvelous. What a consummate intellectual this man is! Every one of his books is a bracing river of fluent readability to delight the non-specialist. Yet each one simultaneously earns its place as a major professional contribution to its own field. Grasp the fact that the field is different for each book, and you have the measure of this scholar. Steven Pinker's professional expertise encompasses linguistics, psychology, history, philosophy, evolutionary theory—the list goes on. There's even a book on how to write good English—for, sure enough, he is a master of that too.

And now *Rationality*. In the final chapter of this book, Pinker raises the serious, even baffling, question of how it could ever have been necessary to mount an argument against slavery, against drawing and quartering, against breaking on the wheel, or against burning at the stake. Isn't the case against slavery obvious? Nevertheless, it had to be made. One could ask the same question about the justification of rationality. How is it possible that rationality needs an advocate? Isn't it obvious? Who will mount an argument against reason? Peter Medawar, elegant patrician among Nobel scientists (he should have won the Literature prize as well) came close, but he was being satirical: "The official Romantic view is that Reason and the Imagination are antithetical, or at best that they provide alternative pathways leading to the truth, the path of Reason being long and winding and stopping short of the summit, so that while Reason is breathing heavily there is Imagination capering lightly up the hill."

Pinker puts the point in the argot of today: "Rationality is uncool. To describe someone with a slang word for the cerebral, like nerd, wonk, geek, or brainiac, is to imply they are terminally challenged in hipness."

And he continues:

> For decades, Hollywood screenplays and rock song lyrics have equated joy and freedom with an escape from reason. "A man needs a little madness or else he never dares cut the rope and be free," said Zorba the Greek. "Stop making sense," advised Talking Heads; "Let's go crazy," adjured the Artist Formerly Known as Prince. Influential academic movements like postmodernism and critical theory (not to be confused with critical thinking) hold that reason, truth, and objectivity are social constructions that justify the privilege of dominant groups.

Only the final member of this list is actively pernicious. The influence of "postmodernism" (whatever that means, for even its advocates seem to have no coherent idea) is probably responsible for the modish elevation of feelings over evidence. One of the many cartoons that adorn this book shows a child who thinks seven times five equals 75 and says, "It may be wrong but it's how I feel." The normally genial Pinker takes the gloves off in the penultimate chapter, "What's Wrong with People," and he can be devastating. Here, for instance, he laments the sinking public trust in universities and attributes it to the universities' suffocating …

> monoculture, with its punishment of students and professors who question dogmas on gender, race, culture, genetics, colonialism, and sexual identity and orientation. Universities have turned themselves into laughingstocks for their assaults on commonsense (as when a professor was recently suspended for mentioning the Chinese pause word *ne ga* because it reminded some students of the racial slur).

It's not just assaults on common sense. There's the wanton debauching of the English language. To clarify the distinction between logical and empirical truths, Pinker says, "To determine whether 'All bachelors are unmarried' is true, you just need to know what the words mean (replacing bachelor with the phrase 'male AND adult AND NOT married') and check the truth table. But to determine whether 'All swans are white' is true, you have to get out of your armchair and look."

What could be clearer? But is Pinker bulletproof against an *oppressed minority* of married males who *identify as* bachelors—those who *feel*, deep down that, though married they truly *are* bachelors—and Pinker's logical point threatens their very existence. Pinker is worried that this kind of nonsense threatens

the reputation of universities. I worry that every campus news story of this kind (and there are many) nets another fat bushel of votes for Donald Trump and his odious acolytes.

The middle chapters amount to a patient instruction manual on how to think rationally. I wouldn't call it a primer; this is state of the art. After the rather demanding chapter on logic, we have a deep discussion of the theory of probability. Pinker is a committed devotee of Bayesian reasoning, and here I learned a lot. It recurs as a *leitmotif* throughout the book. A chapter expounds the economists' notion of rational choice and risk. And of course game theory. The important distinction between correlation and causation gets a whole chapter. The rooster always crows at dawn but which, if either, is cause and which effect? The only sure way to demonstrate a causal relationship is an experimental intervention. Artificially administer the putative cause at random and see whether the putative effect follows. Playing a recorded cock-a-doodle-doo in the middle of the night to see if the sun promptly appears is a stretch, but you get the idea. Of course, you must do it many times and at random. Unfortunately, such experimental intervention is often not possible, especially in studies of human behavior, and Pinker devotes much of the chapter to statistical tricks, which are the next best thing. This leads him to lay out the powerful technique of multiple regression.

There's a chapter on Signal Detection Theory, which has long been a favorite topic of mine, and I was glad his lucid treatment graduated from the classical zone of blips on radar screens to such human-interest topics as decisions by juries. What might courts do to increase *d-prime* (mathematical jargon for the discriminating power of evidence)? Pinker quotes the disturbing findings of Elizabeth Loftus and others on the unreliability of eye-witness testimony. DNA evidence is a boon by comparison. If properly used, DNA identification is equivalent to picking out one man from an identity parade of millions—instead of "at least eight" (as is the rule in English law, for example). Even DNA evidence is vulnerable to accidental contamination or mislabeling of samples, but such human errors can be overcome.

How should *beta* (the decision criterion) be set in a court of law? Should we tolerate condemning one innocent person while letting ten guilty ones go free? What is meant by "reasonable doubt"? I have long thought that if the verdict really is beyond reasonable doubt, there should be no nail-biting tension when the jury returns. It should be obvious to everyone in the court who has heard the same evidence as the jury. Isn't "obvious" pretty much what we mean by "beyond reasonable doubt"? And "beyond reasonable doubt" should also mean that if two juries sat through the same trial and then retired to their separate jury rooms, they should always return the same verdict. But would they? You cannot be serious! Think O.J. Simpson. Might the obviousness of "beyond reasonable doubt" even obviate the need for hotshot lawyers?

The normally genial Pinker takes the gloves off in the penultimate chapter, "What's Wrong with People."

"We evolved not as intuitive scientists but as intuitive lawyers." We evolutionary biologists can well believe that, being members of a highly social species, our ancestors were selected for their ability to outwit, out-general, and out-persuade rivals for mates and economic goods. The same competitive social milieu might have selected our ancestors for their ability to set up alliances—rival gangs. Perhaps this accounts for the "myside bias," which today is attested by ingenious, if depressing, psychological experiments.

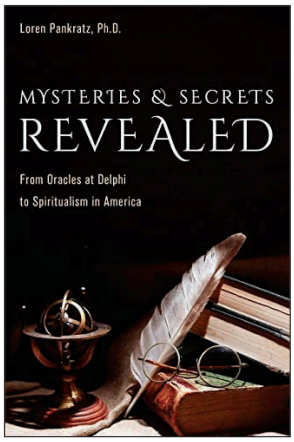
Perhaps the most depressing of these experiments presented Republicans and Democrats with (made-up) data superficially purporting to show that gun control decreases crime. In fact, a critical analysis of the data would show the opposite: gun control leads to an increase in crime (remember this was made-up data!). Only numerate respondents saw through the superficial conclusion. But the interesting fact was that it was numerate Republicans who mostly achieved the necessary perspicacity—supporting a conclusion in favor of their political bias. Numerate Democrats tended to rest satisfied with the superficial conclusion that supported their bias. But here's the kicker: Republicans and Democrats were also presented with *the identical made-up data but with the headings flipped.* Now the data superficially supported the gun lobby, and again you had to be numerate to spot that they actually led to the opposite conclusion. Now it was the numerate Democrats who penetrated to the correct inference, the one that supported their bias. Finally, when the experiment was repeated with the fictitious issue being not gun control but an anodyne one where neither tribe had a dog in the fight, there was no difference between Republicans and Democrats. The depressing conclusion is that we humans believe whatever supports our team, irrespective of the evidence. Indeed, I find it depressing that we even have teams, rather than an abiding loyalty to evidence.

The last two chapters, "What's Wrong with People?" and "Why Rationality Matters," are the ones that I most copiously annotated. If I were to do justice to them, I'd have to quote almost every sentence; they're all so good. I'll just close by contrasting the malign gullibility of "Stop the Steal" QAnon believers, on the one hand, with the disinterested rationality of trained scientists and of Chapter One's Kalahari hunter-gatherers, on the other. How is it possible that the same species includes members capable of measuring the infinitesimal shivering of spacetime itself and others capable of believing that Hillary Clinton runs a pedophile ring from the premises of the Comet Ping Pong pizza restaurant? ■

Richard Dawkins is author of *The Selfish Gene* and other books on evolutionary biology plus, most recently, *Books Do Furnish a Life* and *Flights of Fancy*.

A History of Discoveries, Deceptions, Credulity, and Skeptical Inquiries

William M. London



Mysteries & Secrets Revealed: From Oracles at Delphi to Spiritualism in America. By Loren Pankratz. Lanham, MD: Prometheus Books, 2021. ISBN 978-1-63388-668-1. 472 pp. Hardcover, $29.95.

The title of Loren Pankratz's latest book reminds me of *Breaking the Magician's Code: Magic's Biggest Secrets Finally Revealed*, a popular and controversial series of network television programs broadcasted beginning in 1997. The series featured the "Masked Magician" performing various feats of conjuring and then revealing the trickery he used, which sometimes differed from what other conjurers have used to produce similar feats more impressively. Short clips of the Masked Magician revealing tricks have received tens of thousands of views on the "Magic Secrets Revealed" channel on YouTube.

I would be delighted to see Pankratz's *Mysteries & Secrets Revealed* attract much of the Masked Magician's audience. I'm afraid that Pankratz's careful analysis of details of the history of science, the history of religion, the psychology of deception, and various investigative efforts may be too deep of a dive for many readers. But I expect that devoted readers of this magazine will appreciate the book as a tour de force of engaging storytelling, skeptical inquiry about extraordinary claims, and masterful explications of evidence.

Pankratz demystifies supposed spirit communications, such as knocking noises (rappings), table turning/tipping, table levitation, pendulum swings, ghostly glows at séances, and slate writing. He reveals secrets behind many phenomena, including talking statues in ancient Greece, moving statues, oracles reading sealed letters, firewalking, illusions created with hidden magnets, professed clairvoyance, feats of apparent extraordinary physical strength, seeing while blindfolded, reading concealed words, apparent mind-reading feats, apparent remote vision, and mesmeric demonstrations.

He does much more than reveal mysteries and secrets. He describes how promoters of astrology and the "animal magnetism" of mesmerism gained and then lost credibility. He describes how Lorenzo Valla (1407–1457) exposed the Donation of Constantine—purportedly a document on which papal authority was based—as a forgery. He provides a history of revelation and misinterpreted evidence underlying beliefs in extraterrestrial civilizations. He offers illuminating stories of deceivers, enablers, patsies, false prophets, defenders of orthodoxy, proponents of baseless popular beliefs, hubristic scientists, bumbling investigators, investigators averse to criticism, brilliant scientists, well-designed investigations, disregarded debunkings, wishful thinking, untrustworthy eyewitness testimony, erroneous memories, confirmation bias, and science as a candle in the dark.

Mysteries & Secrets Revealed is an important work of multidisciplinary schol-

arship. Its notes section of nearly seventy pages offers many insightful comments and interesting asides. Its sixty-page bibliography includes important recent works and primary sources going back hundreds of years. The index is accurate and comprehensive. It's a book to keep for future reference.

In the introduction, Pankratz writes that the book takes readers on a journey of discovery focused on people who faced opposition for asking uncomfortable questions about cherished beliefs. The journey begins with investigators of ambiguous messages offered by oracles at Delphi. It shifts to the Italian Renaissance, featuring seekers of truth, such as Galileo, who relied on careful observation. The journey ends with the modern spiritualist movement's roots in the nineteenth century, when impressive skeptics, such as Michael Faraday, applied scientific thinking and testing to expose the trickery used by people claiming psychic powers.

I see the journey as beginning with an emphasis on investigating trickery in ancient history, followed by a detour emphasizing the history of scientific progress in revealing the secrets of nature, and concluding with a renewed emphasis on exposing trickery. I didn't find any explicit rationale for the journey to take this seemingly circuitous path.

The journey made more sense to me after I reconsidered the seventh chapter, "Natural Magick," named for the title of a book by Giovanni Battista Della Porta (1535–1615). The journey encompasses the two types of magic that Porta distinguished: sorcery, which he dismissed, and the hidden secrets of nature he wished to uncover.

Mysteries & Secrets Revealed is an important work of multidisciplinary scholarship.

Pankratz explains that Porta's shortcomings as a researcher prevented him from revealing the hidden secrets of magnetism and other natural phenomena, but Porta learned enough about magnetism to use magnets for trickery.

One of my favorite chapters focused on the hidden secrets of nature revealed by Galileo's efforts to answer uncomfortable questions. Galileo's discoveries and the opposition he faced from inquisitors is obviously relevant to Pankratz's stated focus for his book. Nevertheless, I wondered why Pankratz included Galileo but left out, for example, Charles Darwin, whose work also challenged cherished beliefs. I surmised that the Galileo story provides important context for stories discussed later in the book and clearly fits in the organizational structure of the book.

Following the introduction are twenty-five chapters organized into six parts: (I) Secrets of the Ancient Greek Oracles, (II) Revising and Revisiting the Past (where Porta's story is told), (III) Revising the World (which includes Galileo's story), (IV) Revising the Universe (which examines the history of belief in extraterrestrial spirits), (V) Secrets of Cheats (focusing on fake clairvoyant Alexis Didier [1826–1886], mesmerism research, and hypnosis hype) and (VI) The Mysteries of Nature and Secrets of Spiritualists (especially the notorious Eusapia Palladino).

The stories in *Mysteries & Secrets Revealed* impart many core messages promoted by the skeptics movement. I was disappointed that Pankratz didn't end the book by summarizing them. Nonetheless, I enjoyed his three-page conclusion, which offers interesting afterthoughts about a few of the fascinating historic figures discussed in the book. He imagines what it would be like to meet some of them. And now, so do I. ■

For more, see Pankratz's article "Analysis of an Arthur Ford Séance" on p. 42.—The Editors

William M. London is a professor of public health at Cal State LA, the editor of the *Consumer Health Digest* e-newsletter at Quackwatch, and an online columnist for SI.

Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON

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Critical Thinking

I was happy to see so much discussion of critical thinking in the latest issue of SI (September/October 2022) but was left feeling that this subject can be handled better. It is treated as an intellectual activity, targets mainly pseudoscience, and is aimed at changing other people's minds. It should be presented as a useful practical skill targeted at a wide range of situations and aimed at improving our own beliefs rather than changing others.

Instead of looking at critical thinking as an intellectual skill involving deep analysis of issues, it should be viewed simply as a skill at recognizing how to avoid false beliefs. Others may benefit from fooling us, but we all benefit by recognizing how to avoid being fooled—whether by someone manipulative or someone sincere but mistaken—or by our own faulty assumptions.

We need to recognize common ways we and others can be misled, such as cherry-picked examples, overestimating the likelihood of rare but dramatic dangers, or leaders who manipulate us using fear and anger. Analytical methods such as formal logic are rarely helpful but can scare people away. Examples used in teaching critical thinking should avoid addressing currently controversial topics so the people we want to reach most won't be on the defensive. If we talk about leaders demonizing enemies, it's better to talk about Adolf Hitler than Donald Trump. We want to teach principles, not advance causes.

Bob Korn
Cary, North Carolina

Selling Pseudoscience

Melanie Trecek-King's article "How to Sell Pseudoscience" (September/October 2022) sounded like the current Republican Party platform. We are in so much trouble!

Russell C. Dutnell, PhD, PE
Adjunct Professor, Civil Engineering and Environmental Science
University of Oklahoma
Norman, Oklahoma

E.O. Wilson

I read Massimo Pigliucci's article on E.O. Wilson ("A Different Take on E.O. Wilson," September/October 2022) hoping to find something new and interesting about Wilson. What I found instead was a one-sided hit job.

Wilson is identified as having personal ethics that were "borderline despicable." Were there any quotes from Wilson's writings to substantiate this? No! Not a single actual bit of Wilson's writings; just Pigliucci's unsupported opinion.

Wilson's other sins? He corresponded with scientists who Pigliucci considers racist. Very reminiscent of Steven Pinker's writings in *The Blank State* of how morality is weaponized. Topics so sacrosanct that they cannot even be mentioned.

Pigliucci considers that Wilson's expertise was in ants and did not extend to people. But he quotes Stephen Jay Gould of being critical of Wilson's science. Pigliucci should remember that Gould's expertise was in snails and also did not extend to people. If ever there was a scientist whose political and ethical views informed his science, it was Gould.

Pigliucci considers that, at the very least, there's enough evidence to revise our opinion of Wilson downward. After I finished the piece, I realized that the only reputation that had suffered in my eyes was that of Pigliucci. I can never again read anything he's written without considering it in the light of this article.

Carl S. Gurtman
York, Maine

It annoys me to see you devoting space to politically correct hyperspaces picking over the entrails of E.O. Wilson. Having checked all the beds in the land and found racists in and under each, now they must exhume the dead for inspection. I didn't subscribe for this.

I care little whether Wilson conformed to the ultra-particular and often silly strictures of contemporary thought on race. In fact, I care little about whether the founding fathers or anyone else dead and in the past was a racist. I care much more about their achievements and contributions to human history and progress.

The whole project of divining, stigmatizing, and punishing anyone, living or dead, for unapproved thought—racist, hate, or whatever—is a gigantic humbug. People cannot control what they believe. What they think in the depths of their soul and what they say in private are none of our business. I judge historical figures by their accomplishments and living people by their actions, not what they may think.

I'm royally fed up with the zealots of the woke purity cult. They are feral dogs running around urinating on the inscriptions at the bases of every crumbled monument. Everything is about them. Their public moral exhibitionism and vicious bullying are intolerable impositions. Skeptics of all people should recognize this ugly madness for what it is.

Norman Carlson
Busti, New York

I am not qualified to judge the life and work of Edward O. Wilson or the validity of the tributes to him ("E.O. Wilson Memorial," SI, May/June 2022), but Massimo Pigliucci's response (September/October 2022) is appalling. To call, bluntly and without the slightest qualification, such distinguished figures as Arthur Jensen and Richard Herrnstein, professors of psychology at two of the most prestigious universities in the world, California and Harvard, racists is utterly disgraceful. What they, and J. Philippe Rushton, also a professor of psychology at the perfectly reputable University of Western Ontario, said was that there are—to quote the title of a chapter in the book *The Bell Curve* by Herrnstein and Charles Murray (surely the most misrepresented book ever published!)—"Ethnic Differences in Cognitive Ability." In plainer language, racial differences in intelligence. This is undoubtedly worthy of scholarly attention, and their treatment of it was purely academic. Whatever the nature of Wilson's association with them, it should, as his defender Bert Hölldobler says in Kendrick Frazier's piece about him ("E.O. Wilson: A Life in

Nature, Citizen of the Biosphere," May/June 2022), be set against the vast range of Wilson's assertions containing nothing supportive of racism, and his clear condemnation of it also quoted there.

As Hölldobler also says ("A Brief Response to Pigliucci's Column on E.O. Wilson," September/October 2022), we now label people as racists far too quickly. I have long thought that anyone who dares suggest that there are any racial differences at all other than the obviously undeniable physical ones risks being called a racist. And he rightly condemns Stephen Jay Gould and Richard Lewontin, both avowed Marxists, proponents of a failed system whose attempted induction killed millions. As Hölldobler nicely puts it, "Saying [Wilson's] science was affected by ideology and praising Gould and Lewontin as pure, ideology-free scholars is just total rubbish." Neither was qualified in psychology, but Gould somehow acquired a totally unjustified "if-he-says-it's-wrong-it-must-be-wrong" aura. I heard him speak once, and the very words used by Hölldobler, *pompous* and *arrogant*, came to mind, together with *conceited* and *patronizing*.

Ray Ward
London, United Kingdom

Massimo Pigliucci responds:

My commentary on E.O. Wilson obviously hit a nerve, at least in some quarters of the skeptic community. Good! That was the point. Skepticism is, literally, about inquiry, and inquiry can be disconcerting and disturbing. But it is our intellectual duty to carry it out while at the same time attempting to overcome our own prejudices and preconceived opinions. In this spirit, let me briefly address some of the points made by readers.

My essay has been described as "a one-sided hit job," while in fact it begins with praise of Wilson for his indubitable scientific accomplishments. The piece was also explicitly meant to redress an imbalance created by the far too positive comments published in SI authored by Richard Dawkins, Sean Carroll, and Steven Pinker. I should think skeptics would welcome different points of view so that they are better able to make up their minds about controversial issues or people.

One reader says that what I wrote is "just Pigliucci's unsupported opinion," from which I have to infer that we have different conceptions of what counts as "unsupported." I brought to bear a number of facts from Wilson's life, as well as the opinions of two contemporary historians of science who have actually looked into the Wilson archives, among other sources. That does not sound "unsupported" to me.

Some readers seem to be under the misconceived notion that I despise Wilson while worshiping Stephen Gould. Neither is correct. I have great respect for much of the work Wilson did as a biologist. And I have actually published a pointed criticism of one of Gould's books in these very pages several years ago (SI, November/December 1999). Nor am I a Marxist by any stretch of the imagination. Or a politically correct woke, whatever that means. I simply think that—in this case—Gould and Lewontin's original criticisms of Wilson were on target and have remained so in the intervening years.

"Pigliucci considers that, at the very least, there's enough evidence to revise our opinion of Wilson downward." Actually, that was a quote from my colleague Jerry Coyne. Anyone familiar with Coyne will most certainly not consider him a friend of political correctness or wokism. And yet Coyne has been intellectually honest enough to admit that Wilson's behavior on several occasions has been troubling. Perhaps intellectual honesty is not considered among the desirable virtues of modern skeptics?

Another commentator says that "people cannot control what they believe." Setting aside that that's empirically false, we are not talking about beliefs but actions. Surely people can control their actions when they realize that their beliefs may be pernicious and hurtful, no? Like helping a colleague to get a tenured position that he did not deserve and that gave said colleague a safe space to keep working on the pseudoscience of race biology.

I am told that we should "judge historical figures by their accomplishments and living people by their actions." That is precisely what I and other commentators have done: assessing Wilson's accomplishments (many very positive) and actions (some not at all good). I'm not sure, however, why the latter assessment ought to be limited to living people. Are the dead beyond criticism just in virtue of being dead?

The letters make liberal use of words such as vicious, purity cult, bullying, *and so forth. Really? Criticizing someone on the basis of what they have done and said now amounts to vicious bullying? Documenting actions with a strong racist overtone betrays one as the member of a purity cult? Or is it, perhaps, that writing outraged letters that pay no attention to the possible merits of a given position is itself a form of attempted bullying based on a purity test?*

As for Arthur Jensen, Richard Herrnstein, and especially Philippe Rushton, I honestly wonder whether their defenders have actually read anything these people have written. And if so how exactly they respond to, as opposed to simply dismiss, the arguments brought forth by their critics over many years of scholarly debates. To claim that their work was "purely academic" and had no overt racist implications is nonsense on stilts that flies in the face of the evidence.

Steven Pinker's long-held but controversial rejection of "group selection" led him to include a dubious criticism in his tribute to E.O. Wilson ("Three Tributes to E.O. Wilson: Was He Our Modern-Day Darwin?" May/June 2022): "Late in his career, he claims to have rethought the widespread rejection of group selection as an explanation for altruism, though the record shows that he had never relinquished the idea in the first place. He held it even during the heyday of William Hamilton, George Williams, and Richard Dawkins, who showed that adaptations are for the benefit of the gene."

However, Pinker's "appeal to authority" was clearly mistaken regarding Hamilton, a strong proponent of group selection within the "multilevel selection" framework that Wilson promoted. Yes, Hamilton's 1964 inclusive fitness concept was gene-centric, proposing altruistic behaviors can evolve when they promote the reproduction of genes shared among kin. However, biology-outsider George Price soon convinced Hamilton he'd made an "averaging fallacy" by assuming altruism observed at the population level reflects selection at the individual gene carrier level. The Price Equation instead statistically partitions selection into within- and between-group components, or multilevel selection. Hamilton thus realized that "selfishness beats altruism within kin groups, just like any other kind of group, and evolves only because kin groups with more altruists contribute more

to the total population than kin groups with fewer altruists. The importance of relatedness for the evolution of altruism was to segregate the altruists and selfish individuals into separate groups" (as explained in 2017 by E.O. Wilson's coauthor on multilevel selection, David S. Wilson, https://thisviewoflife.com/focus-article/reaching-a-new-plateau-for-the-acceptance-of-multilevel-selection/).

Hamilton therefore helped Price publish his equation in 1970 and 1972 and reframed inclusive fitness within multilevel selection in a 1975 paper of his own. Skeptical Inquirer readers should be aware that the weight of opinion in evolutionary biology is now actually on Wilson's side rather than Pinker's.

David Leake, PhD, MPH
Kaneohe, Hawaii

Steven Pinker responds:

There is no "appeal to authority." In my essay "The False Allure of Group Selection," I have explained in depth why most invocations of "group selection" are confused or wrong and replied to invited commentaries from the major defenders of group selection, including David Sloan Wilson. An example of this confusion is the framing of the issue of "groups" as "kin groups," in which case "group selection" is just a roundabout way of describing gene selection; what's at issue is whether selection among groups of unrelated individuals can result in adaptations in individuals. As for the "weight of opinion in evolutionary biology," Peake cites no data, but after E.O. Wilson and two coauthors tried to revive group selection in a 2020 Nature *article, 136 evolutionary biologists coauthored a rebuttal, which was published together with four other critiques. For a recent overview, see J. Arvid Ågren's* The Gene's-Eye View of Evolution.

Is Autism a Spectrum?

In his article "Is Autism Really a Spectrum?" (September/October 2022), Stuart Vyse asks whether "people at opposite ends of the spectrum are more properly considered *quantitatively* different or *qualitatively* different."

DSM is a diagnostic and statistical manual designed to remove all meaning from diagnoses, rendering statistical studies more feasible. The DSM is classification, similar to the Dewey Decimal System. Name and rank are removed, a serial number remains, and identity is sacrificed for utility. As the DSM replaced categorical diagnoses with numbers, it was welcomed by biological psychiatrists and insurance companies.

We may consider Kraepelin's "dementia praecox" as a qualitative distinction of those with a loss of the capacity to make qualitative distinctions, from those with affective disorders and hypertrophy of this capacity.

There are two kinds of people: those who put disorders on a continuum, and those who don't. Mental health depends on the intercourse of the two. So long as DSM is considered meaningful, rather than as a successful and brilliant manual for statistical research, the result will be the same disorganized thinking one finds in schizophrenia, autism, and managed care.

John Jacobs, MD
Manchester, New Hampshire

I am the father of a twenty-eight-year-old autistic son, and I have followed perceptions of autism in the media for most of those twenty-eight years. I agree wholeheartedly with Stuart Vyse's concerns about autism spectrum disorder. Young people with what was previously called Asperger's Syndrome face multiple challenges, but they are not at all the same as the ones faced with more classic autism. However, young people with severe language disabilities often cannot speak for themselves, so those more classically Asperger's become the public face of autism.

Thus, we hear of the disparaging of behavioral or medical treatments or the description of people with autism as just people who think differently and only need public acceptance. Children who cannot speak or handle daily living skills face challenges that public acceptance or recognition won't help them with. I worry that children and adults with severe needs are often ignored in favor of those with access to the megaphone of public opinion.

One can hope that this will be fixed in future editions of the DSM, but I don't hold out much hope.

Thank you, Dr. Vyse, for your article.

Charlie Gale
Charlotte, North Carolina

January 6 Committee

Fascinating—and disheartening—article about the January 6 committee ("Jan. 6 Investigation Testimony Reveals Conspiracy-Riddled Trump White House," September/October 2022).

If both sides had behaved like grown-ups, then Democrats would call witnesses, and Republicans would cross-examine them. Then Republicans would call witnesses, and Democrats would cross-examine them.

Instead, the Democrats vetoed some of the Republican nominees to the committee, and the Republicans picked up their marbles and went home.

The result is something like a one-sided show trial, which is convincing only to people who were convinced already.

Taras Wolansky
Kerhonkson, New York

Poop Pill

Nicole Scott writes in "New Fitness 'Poop Pill' Promises Olympic-Level Results" that "anyone can run in the Boston Marathon by paying a $205 entry fee, so not everyone running would be considered a 'super-athlete.'" In fact, Boston is unusual among large marathons for having qualifying times for each gender/age bracket. Whether this threshold qualifies them as "super athletes" is questionable (I like to think so since I didn't qualify!), and it's certainly not "Olympic-level," but if you were looking for a sample of high-performing athletes, you could do a lot worse than Boston Marathon runners. This doesn't refute any of Scott's main criticisms of the poop pills, as I don't think the veracity of the health claims rests on the athleticism of those who gave samples.

Michael Jones
Manchester, Missouri

Nicole Scott responds:

Thank you for pointing out the qualifications for the Boston Marathon. I must admit I relied on a trusted source for that information and should have researched it more thoroughly, utilizing the critical

thinking skills the Skeptical Inquirer *promotes above all else.*

Superstitious Skeptics

Julia Lavarnway enquires about people who don't believe in superstitions but act them out anyway ("'I'm Not Superstitious, but I Am a Little Stitious': Even Skeptics Cross Their Fingers," September/October 2022). A tip for any "stitious skeptic" who might like to minimize their level of hypocrisy: Instead of saying "[God] bless you" when someone sneezes, use the equivalent German term *gesundheit*. This preserves the ritual of courtesy without any appeal to the supernatural, as *gesundheit* simply means "health."

Martin Stubbs
London, United Kingdom

The Philosophy of the Quest for Immortality

In his book review of *The Price of Immortality: The Race to Live Forever* ("Questioning the Quest for Immortality," September/October 2022), Gabriel Andrade compares the possible benefits of the quest for immortality with Pascal's wager, neglecting to notice that the whole point of Pascal's wager is that it only pays out when you are dead.

Martin Stubbs
London, United Kingdom

Gabriel Andrade fails to note that Parfit's argument that the aggregate happiness must increase even if the average decreases with population is equally "valid" when applied to misery or unhappiness. It is difficult enough to convert subjective feelings to a numerical scale where averages and sums make sense, but it becomes completely meaningless if negative values are not allowed. Misery and anger, even to the extent of murder and suicide, are real and have negative values. I am skeptical that philosophers have not been "decidedly refuted" by philosophers, but if this is true, it does not speak well for the profession.

Robert Clear
Berkeley, California

Weapons of Mass Agenda?

Benjamin Radford's "Debunking WMD Conspiracies" (September/October 2022) asks: Don't you think that [insert most recent news story] is just a planned distraction from the real issues so we don't talk about [insert favored "real issue"]?

A better characterization than "distraction" may be "agenda." I am skeptical of a "powerful cabal of media owners and billionaires making a sustained effort to distract the general public away from class wars and economic inequality"—perhaps akin to herding cats. What about billionaire-class "1-man cabals" (1MC)? Think Rupert Murdoch and his Fox News franchise.

Another 1MC is Barre Seid, who donated $1.6 billion to conservative causes to advance his personal political agenda: undermining climate change science, nominating conservative judges, fighting Medicaid expansion, advancing higher education in a conservative mold.

The "99 percent" collectively lack discretionary economic means to rebut—let alone compete with—a 1MC, so the 99 percent lack an "equal" (level) playing field. Tactics used by 1MC are designed to distract from class issues by reframing discourse as culture issues.

Case in point: In 1934, socialist writer Upton Sinclair won the California Democratic primary for governor on a platform to end poverty. Republican opponents defeated Sinclair by using false attack ads. The 1MC behind the Republican campaign was Irving Thalberg, an MGM Studios producer who declared, "Nothing is unfair in politics."

Another "C"-word for *cabal* is *cartel*. Think OPEC, Latin American drug cartels, et al. Conspiracies attributed to "cabals" may be fanciful; however, a 1MC is as real as cartels.

Miles Yan
Orange County, California

Dreams of Our Ancestors

Massimo Polidoro's article in the September/October 2022 issue contains some errors that possibly should have been edited out before publication. According to Wikipedia, the names of the friends of Marcel Ravidat were Jacques Marsal (not Marsals), Georges Agnel (not Agniel), and Simon (not Simone) Coencas. I believe all four, not three, entered the cave. Also, I can't find any information that Cro-Magnons existed in North Africa let alone North America.

Frank M. Archer
Delta, British Columbia
Canada

Menopause Manifesto

In her review of Dr. Jen Gunter's *The Menopause Manifesto* (September/October 2022), Julia Lavarnway says "Unfortunately, there is no index, which I think would have been helpful for those reading the print version." My copy *does* have an index, so I find her statement very strange.

Albert Braunstein
Highett, Victoria
Australia

Julia Lavarnway responds:

Neither the advanced hard copy of the book I received from the publisher nor the e-book version I purchased had indexes. So it must be that the final printed hard copy of the book did have an index, but I was unaware. I regret the oversight, and I thank Dr. Braunstein for bringing it to my attention.

[FEEDBACK

The letters column is a forum on matters raised in previous issues.

Letters should be no longer than 225 words.

Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@skepticalinquirer.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter.

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A lone bison captured by late Skeptical Inquirer Editor Kendrick Frazier along the Madison River in Yellowstone National Park on September 6, 2022. Frazier was an accomplished amateur nature photographer and often shared with family and friends the photos he took on his and his wife, Ruth's, many travels around the world.